Vera Rubin and Lambros Comitas

Gâanja in Jamaica
Ganja in Jamaica

A medical anthropological study of chronic marihuana use

VERA RUBIN and LAMBROS COMITAS

Mouton · The Hague · Paris
Dragons in dark caves, Justice Oliver Wendell Holmes once reminded us, are far more fearsome than when they are seen in daylight. How refreshing it is, therefore, to have available an objective study which not only exposes but also demolishes many emotional and “fright-symbolic” dragons which have clouded our perspective in recent years with reference to cannabis. It is refreshing, also, to see the results of so many individuals and institutions working together, scientifically, separating “fact from fiction” in an area so important to human beings everywhere, namely, the use of a psychotropic substance such as marihuana.

The Jamaica study, sponsored by the Center for Studies of Narcotic and Drug Abuse, National Institute of Mental Health, was the first project in medicalanthropology to be undertaken and is the first intensive, multidisciplinary study of marihuana use and users to be published. While marihuana research has been heavily funded in the past decade, because of legal obstacles most of the studies of human subjects have been largely confined to laboratory settings and/or to special subject samples, not necessarily representative of “normal” populations. Extensive sociological surveys have been undertaken about the incidence and prevalence of marihuana use — a number of which were initiated by the National Commission on Marihuana and Drug Abuse, of which I had the privilege to serve as Chairman — and have provided valuable data.

The Jamaica study was of especial value to the work of our Commission as it added a new dimension in that research was conducted in the field as well as in the laboratory; background
studies were carried out in the natural setting from which the subjects were drawn for clinical examinations. The study examines **ganja** use as part of the life style of the Jamaican working class where its use in various forms is endemic and delineates the traditions and value systems that control marihuana use and condition expectations and reactions to its use.

While Americans are concerned with the alleged "amotivational" and drug escalation effects of marihuana, **ganja** in Jamaica serves to fulfill values of the work ethic; for example, the primary use of **ganja** by working-class males is as an energizer. Furthermore, there is no problem of drug escalation in the Jamaican working class; as a multipurpose plant, **ganja** is used medicinally, even by non-smokers, and is taken in teas by women and children for prophylactic and therapeutic purposes. For such users, there is no reliance even on patent medicines, amphetamines or barbiturates, let alone heroin and LSD. Further, the use of **ganja** appears to be a "benevolent alternative" to heavy consumption of alcohol by the working-class. Admissions to the mental hospital in Jamaica for alcoholism account for less than one percent annually, in contrast to other Caribbean areas where **ganja** use is not pervasive and admission rates for alcoholism are as high as 55%.

This study indicates that there is little correlation between use of **ganja** and crime, except insofar as the possession and cultivation of **ganja** are technically crimes. There were no indications of organic brain damage or chromosome damage among the subjects and no significant clinical (psychiatric, psychological or medical) differences between the smokers and controls. The single medical finding of interest, and this is a trend, is the indication of functional hypoxia among heavy, long-term chronic smokers. **Ganja** is customarily mixed with tobacco and **ganja** smokers are also generally heavy cigarette smokers (many of the controls do not smoke at all). It was impossible to distinguish between clinical effects of **ganja** and tobacco smoking and cigarette smoking; it is, consequently, suggested that smoking per se may be a factor in this finding.

Despite its illegality, **ganja** use is pervasive, and duration and frequency are very high; it is smoked over a longer period in heavier quantities with greater THC potency than in the United States, without deleterious social or psychological consequences. The major difference is that both **ganja** use and expected behaviors are
culturally conditioned and controlled by well-established tradition. The findings throw new light on the cannabis question, particularly that the relationship between man and marihuana is not simply pharmacological, and indicate the need for new approaches.

There are always risks inherent in the use of any "drug", including aspirin, and non-adaptive uses and pathological reactions may occur. To what extent the "pathology" is inherent in the substance and to what extent in the society or in the consumer is the research problem that must be divorced from spurious issues, especially in the case of marihuana. Stereotypes and demon theories about marihuana do not illuminate the causes of social or personal problems.

I congratulate all the individuals and institutions connected with this objective study, with kudos to Vera Rubin and Lambros Comitas for this particular volume. Everyone agrees that continuing research and evaluation is necessary. And this study is another building block in the structure being made by man in his growth of knowledge about himself and his environment.

Raymond Philip Shafer,
Chairman National Commission on Marihuana and Drug Abuse
Governor of Pennsylvania, 1967–1971
Preface and acknowledgements

This volume presents the findings of an investigation of the effects of chronic cannabis smoking carried out by the Research Institute for the Study of Man (RISM) in collaboration with the University of the West Indies (UWI), supported by the National Institute of Mental Health (NIMH), U.S. Department of Health, Education, and Welfare (Contract No. 42-70-97).

In January 1970, the NIMH Center for Studies of Narcotic and Drug Abuse invited RISM, incorporated in 1955 as a non-profit scientific and educational organization, to consider conducting a study of the effects of chronic cannabis smoking in the West Indies, a region in which it had previously initiated and supported considerable social science research. RISM proposed a multidisciplinary, medical and anthropological study in Jamaica, where cannabis use has been widespread in the working class, and where collaboration with the Faculty of Medicine of UWI was considered possible.

A number of critical issues had to be explored before a project of this nature could be mounted: namely, the attitude of the Jamaican Government – which prohibits the cultivation, use and possession of cannabis – with regard to an intensive and, perhaps, politically sensitive research project; and the official position of the UWI, a regional institution accountable not only to Jamaica but to most of the other nations and territories of the Commonwealth Caribbean; the interest of staff members of the Faculty of Medicine of the UWI in collaboration; the availability of specific clinical and laboratory facilities at UWI; whether space and attending staff for 60 subjects could be provided; and whether long-term cannabis smokers could
be recruited and be assured of immunity from legal sanctions during the course of the study.

Discussions of these and related administrative issues were held with various authorities in Jamaica. The Minister of Health, Dr. H.W. Eldemire, gave an assurance of Government interest and cooperation. Commissioner of Police A.G. Langdon indicated that while the Jamaica Constabulary would be neutral they would not harass either the field researchers or the subjects selected for the in-hospital clinical studies. Given our ethical and practical concerns about the protection of both subjects and staff, the latter assurance was essential and most welcome.

Senior medical staff of the University Hospital saw the merit of the proposed collaboration and organized full support of the project. Laboratory facilities and equipment were more than adequate, and arrangements were made for beds in a special research unit of the hospital. Administrative procedures were amended to preserve the anonymity of the subjects and to assure the confidentiality of all individual records.

One legal problem arose in connection with the clinical studies. The initial design included clinical research on the short-term acute effects of smoking cannabis. However, there is no legislation which specifically could have permitted this sort of privileged exemption from the law. Consequently an expert committee was appointed by the Vice Chancellor of the University, Professor O. Roy Marshall, to examine the legal implications of the use of cannabis on hospital premises; the committee advised against University participation in research on short-term effects. Accordingly, it was agreed that research at the University would concentrate on clinical studies of long-term effects of smoking cannabis.

Finally, preliminary anthropological surveys in a number of Jamaican communities established that field research of cannabis-related activities was possible and that subjects were available and would volunteer for the clinical studies at the University Hospital. Having established feasibility, a final research proposal was submitted to and accepted by the Center for Studies of Narcotics and Drug Abuse. This agreement with an effective date of June 25, 1970, included a subcontractual arrangement between RISM and the University of the West Indies for the examination and primary analysis of clinical data on sixty subjects. The project got under
way at the end of June 1970, starting with anthropological field studies which continued for 18 months. The first subjects were admitted to the University Hospital in November 1970. Analysis of both the anthropological and clinical data, a continuous process throughout the life of the project, was completed in February 1972. The final project report, *Effects of Chronic Smoking of Cannabis in Jamaica*, was submitted to NIMH in March 1972 and was then officially presented to Dr. Kenneth McNeill, Minister of Health and Environmental Control, the representative of the newly elected Jamaican Government.

This volume results from the work of the forty-five professionals, listed at the end of this preface, who comprised the staff and consultants of the Jamaica Project. The successful realization of the research objectives was made possible by extraordinary individual and collective efforts. Full technical reports on each topic of investigation, originally prepared by individuals or research teams, were presented in the final report of the Project. Credits for work used in this integrated presentation are listed below by chapter. Responsibility for the overall analysis and for any possible errors of fact or interpretation rests solely with the authors of this volume.

Chapter III (Ganja legislation) relies on the archival research of James Whetton, Department of Sociology, University of Birmingham, United Kingdom.

Chapter IV (The ganja complex) draws primarily on the community-level cases and descriptions collected and initially analyzed by Melanie C. Dreher, School of Health Sciences, University of Massachusetts, and on ethnographic data collected by Claudia Rogers, Department of Anthropology, University of Miami.

Chapter V (Acute effects of ganja smoking in a natural setting) is an abridged and revised version of a full project report presented by Dr. Joseph H. Schaeffer, Center for Urban Studies and Programs, Teachers College, Columbia University and the Project in Human Communication, Bronx State Hospital, New York City. Dr. Schaeffer's research was carried out in association with Jane I. Schaeffer and with the field assistance of Dr. Michael Ashcroft, Dr. George Miller and Mrs. Eric Cruickshank of the University of the West Indies, and Professor Orrea Pye, Dr. Mary Bal and Judith Wylie of Teachers College, Columbia University.

Chapter VI (The clinical studies) draws on the project report
of medical findings by Professor Eric K. Cruickshank, Professor and Head, Department of Medicine, University of the West Indies. Professor Cruickshank carried the responsibility for all non-psychiatric clinical and laboratory research and conducted project medical examinations.

Chapter VII (Respiratory function and hematology) is based on the analysis of the statistical findings on lung function by Dr. A.L. Loomis Bell, Jr., College of Physicians and Surgeons, Columbia University and Director, Division of Pulmonary Diseases, St. Luke's Hospital Center, New York City. The hematological section is based on a review of the findings and discussion by Dr. John F. Bertles, College of Physicians and Surgeons, Columbia University and Director, Hematology Division, Medical Service, St. Luke's Hospital Center, New York City.

Chapter VIII (Psychiatry and electroencephalography) relies on the project report on psychiatric findings by Professor Michael H. Beaubrun, Professor and Head, Department of Psychiatry, University of the West Indies in association with Dr. Frank Knight, Department of Psychiatry, University of the West Indies. Professor Beaubrun directed the psychiatric and electroencephalographic project studies and supervised the psychological testing program. Dr. Charles Thesiger, Department of Psychiatry, University of the West Indies, with the assistance of Alwyn Beecher, Bellevue Hospital, Kingston, Jamaica, conducted the electroencephalographic testing. The findings presented in this chapter are based on the review of the EEG protocols and analysis of Dr. Julius Korein, New York University Medical Center and Chief, EEG Laboratories, Bellevue Hospital, New York City.

Chapter IX (Psychological assessment) is based on a project report analyzing the psychological test results by Dr. Robert M. Knights, Department of Psychology, Carleton University, Ottawa, Canada. Psychological tests were administered by Hilary Sherlock, Department of Psychiatry, University of the West Indies.

Chapter X (Attitudes and reactions to ganja) analyzes the life history data collected by Barry Chevannes, Institute of Social and Economic Research, University of the West Indies.

Appendix V (Chromosome studies, steroid excretion, and peripheral thyroid hormone levels) is based on a chromosome report by Dr. Marigold J. Thorburn with the assistance of Miss S.
Hutchinson, both at the Department of Pathology, University of the West Indies; on a steroid excretion report by Dr. Per Vestergaard, Principal Research Scientist, Rockland State Hospital Research Center, State of New York; and on an analysis of peripheral thyroid hormone levels by Thomas B. Cooper, Associate Research Scientist, Rockland State Hospital Research Center, State of New York.

Computer programming and statistical analysis of all the clinical and life history data, carried out at the Research Institute for the Study of Man, were under the direction of Robin Chard, Senior Research Scientist, Division of Youth, State of New York. Computerization of psychiatric data was facilitated by Dr. Nathan Kline, Director, Research Center, Rockland State Hospital, State of New York.

Our colleagues, Dr. Michael H. Beaubrun and Dr. Eric K. Cruickshank, co-directors of the clinical studies at the University of the West Indies, carried the burden of coordinating the intensive and extensive examinations of the subjects in addition to their own heavy professional schedules. We gratefully acknowledge their wisdom and dedicated participation in the research; without their collaboration this volume would not be possible.

Special gratitude is due to the many North American and West Indian consultants who collaborated on the analysis of various aspects of the research and to the laboratory and nursing staff of the University Hospital of the West Indies.

Administration of this multidisciplinary project necessitated complex record keeping and data organization procedures. Mrs. Stella Beaubrun, with great competence and congeniality, took charge of the patient flow through the various hospital departments and the processing of their coded confidential records. Mrs. June Anderson, Research Institute for the Study of Man, coordinated the flow of data from Jamaica and the myriad logistical and administrative details of the project and was involved with every step that led to this volume.

We also wish to acknowledge our appreciation to Dr. O. Roy Marshall, Vice-Chancellor of the University of the West Indies at the time of study, for his support of this politically sensitive project, and to Miss Eleanor Carroll of the Center for Studies of Narcotic and Drug Abuse, National Institute of Mental Health, for her constant encouragement and support of the research.
Finally, we cannot adequately convey our debt to the subjects who agreed to participate in the clinical studies and to the many Jamaicans who welcomed us into their homes, permitted us to share their experiences and made it possible for us to understand the *ganja* complex.

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Vera Rubin  
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Chapter I

Introduction

Popularly called marihuana in the United States and Latin America, cannabis is known by many names in different parts of the world. In Jamaica it is commonly called *ganja*, the name introduced to the island in the nineteenth century, along with folk uses of the plant, by East Indian indentured laborers brought to work on Jamaican sugar plantations. Use of cannabis for a variety of purposes spread among the rural and urban working-class population, generating a sociocultural complex termed here the "*ganja* complex." Resulting from extensive anthropological and clinical research carried out in the field and in the laboratory during a two-year period (1970–1972), this book is a study of the *ganja* complex and of the clinical effects of chronic long-term smoking of *ganja*.

As a result of public preoccupation with "the marihuana habit," there has been a burst of support for research in the United States. More reports have been written about cannabis in the last decade than in any previous period.\(^1\) Despite the profusion of studies and intensive public interest, scientific research specifically on the effects of chronic use of cannabis on human subjects has been minimal. Research on human subjects has been limited, partly because cannabis is illegal;\(^2\) subjects for clinical studies have generally been drawn from "captive" populations: prisoners, psychiatric patients and

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2. Legal difficulties besetting marihuana researchers in the United States are described in Zinberg and Robertson (1972) and Brecher *et al.* (1972).
student volunteers. Scientific attention has been centered on experimental studies of short-term, acute effects, under laboratory conditions, rather than on subjects in the "complex human environment." Sociological investigations, although less constrained by law, generally have been limited to retrospective reports of acute reactions and surveys of past and current use.

Comparability of scientific findings is frequently clouded by lack of precise information about the frequency and duration of use, the quantity and grades of cannabis used and the content of the active ingredient tetrahydrocannabinol (THC). The interpretation of clinical and sociological effects attributed to cannabis is often obscured by the unassessed effects of other drugs in current and past usage. Disregard of personality differences and varied social backgrounds in sample populations are additional methodological problems that may account for conflicting reports on human subjects. Partly because it has not been expedient to carry out epidemiological mapping of long-term users, less research has been done on the effects of long-term chronic use of cannabis than on acute effects.

After a review of research reports in 1968, Kalant and Kalant noted that "information currently available [about chronic use effects] ... is not nearly as complete or as conclusive as information about the acute effects" (1968:15). The Canadian Commission reported: "There is little reliable information on the long-term effects.

3. Zinberg and Robertson note that "theories of pharmacological action for a drug established in experiments with laboratory animals in a laboratory setting are often almost entirely irrelevant to the short-term or long-term effects of the same drug in our complex human environment" (1972:59).

4. The Indian Hemp Drugs Commission Report of 1894 is a notable exception with regard to specifying the grade of cannabis used and the question of drug "admixtures." The introduction to a questionnaire in Chapter VI of the report gives the following instructions: "It is very important, in answering the questions framed under this chapter, to distinguish carefully between ganja, charas, and bhang. The answer should deal only with the form of hemp known to witness, and should clearly specify in each case the form or forms to which his statements apply, and the particular experiences on which they are based. Question 56 deals with the effect of admixtures. This should also be referred to in answering any questions where any such admixture generally affects the case. But the answer ought, in the first instance, to deal with the effect of hemp drugs apart from any such admixture"(Great Britain 1969:ix).

5. Tetrahydrocannabinol is considered one of the primary psychoactive constituents of cannabis, responsible for psychoactive effects, particularly the isomer D9-THC, commonly referred to as "Delta-9."
physiological effects of cannabis ... the majority of the Eastern studies (Morocco, India, Egypt) have no control groups of comparable non-users for reference standard, and clinical findings are usually confounded with a variety of social, economic, nutritional, hygienic and cultural factors, which are not easily separated" (Canada 1972:114). Similarly, the United States National Commission on Marihuana and Drug Abuse found that "a recent comprehensive and critical review of marihuana research revealed that all but one of the experimental studies of marihuana on human behavior have only focused upon the effects of acute doses" (National Commission, v. I, 1972:69).

The Mayor's Committee (1944) study, initiated in 1938, included subjects with a history of long-term use; there have also been several more recent studies of the effects of oral administration of marihuana (extracts or synthetic preparations) to chronic marihuana users (U.S. DHEW 1971:65–66, 72; National Commission, v. I, 1972). However, the emphasis of recent research has been on the analysis of acute clinical reactions to cannabis preparations administered in the laboratory. Few studies have examined the total environment of the marihuana smoker, that is, the study of the subject in his community and his society; and fewer studies have undertaken multidisciplinary research on the same subject population.6

Furthermore, most of the research on marihuana has been carried out in the United States. Only recently have federal agencies responsible for drug studies recognized the need to carry out research in other areas of the world with older, more pervasive histories of cannabis use. This recognition has led to the encouragement and support of research in several foreign countries where cannabis use is endemic and traditional. The Jamaican research reported in this volume stems directly from this interest in cross-cultural comparison.

If, as has been noted, "the consequences of habitual and chronic use can only be observed in populations of heavy users" (National Commission, v. I, 1972:69), Jamaica provides an ideal setting for research. It has what is probably the highest density of cannabis use.

6. Although the methodology of the Mayor's Committee study has been criticized in some quarters, it is an outstanding exception as a multidisciplinary study. The subjects, however, were literally a captive population.
users of any country in the Western Hemisphere. Jamaica, which achieved independence in 1962, is the largest of the former British West Indian islands. Nevertheless, it is a small society. In 1970, it had a population of 1,861,300, compactly settled within 4,411 square miles, having approximately 422 persons to the square mile. Large mountainous areas, once the refuge of runaway slaves, were later settled by freedmen who left the sugar plantations to establish new ways of life in hamlets and villages that now have distinctive social, economic and cultural patterns. Approximately a quarter of the island is level, cultivated by international sugar cane corporations and large-scale Jamaican farmers whose operations employ a mass of rural laborers and sustain a rural middle class. Finally, there are rapidly developing urban areas: one around Montego Bay, dependent on the tourist trade, and another around the capital city, Kingston, which contains nearly a quarter of Jamaica’s population. Among the working class, of both rural and urban areas, ganja use is pervasive. In at least one religiopolitical group, the Rastafarians, the use of cannabis has been ritualized, and ganja is a basic element in their belief system. More recently, cannabis use has been taken up, on a more limited scale and somewhat covertly, by members of the middle class.

The physical and social characteristics of the island facilitated the planning and conducting of the research project, but the study was carried out in the shadow of the stringent Jamaican laws enacted since 1913 against the cultivation, possession and use of cannabis. Since Jamaica has not formulated codes to protect scientific investigations of cannabis or drug use, it was not possible to use standard techniques of sampling; nor could studies of acute cannabis effects be undertaken at the University Hospital. Nevertheless, the situation and general atmosphere at the time permitted one experimental study of acute effects in the open countryside. The long-term residence of the project social scientists in the communities made it possible to obtain the cooperation of the people and establish their confidence in the project.

To achieve the broad objectives of the project, two distinct but integrated research thrusts were made. One was primarily social scientific and field-based, with ethnohistorical, anthropological and sociological components. The other was clinical and hospital-based, with medical, psychiatric and psychological components; the
research groups collaborated and reciprocally stimulated new investigative efforts.

The objectives of the social science team were to determine the extent of cannabis smoking and other patterns of *ganja* use among the Jamaican working classes, to select samples of smokers and non-smokers for clinical study and to document the behavioral context within which clinical findings could be fully explored. There were two phases of field investigation. The first, which took about three months in mid-1970, was a pilot study of the role of *ganja* in Jamaican ways of life. During this initial phase, anthropologists surveyed six localities, three in rural districts in southwestern parishes, two in southeastern parishes and one in the slum area of Kingston. As there had been no previous systematic study of *ganja* use in Jamaica, the field researchers examined the cultural and sociological aspects of *ganja* use in the communities. They recorded widespread and heavy use of *ganja* among the working classes; laid the ground for observation of *ganja* cultivation, local distribution and consumption patterns in the communities; developed guidelines for selection of representative settlements for the second phase of research; identified potential subjects for the clinical study; and developed working hypotheses for the second phase of anthropological field research.

During the second phase, which began early in 1971 and lasted for a year, two anthropologists made separate studies of two communities; two others concentrated on one locality in separate studies; another collected life histories of the people selected for clinical study; and a sociologist carried out archival research on the history of *ganja* legislation in Jamaica.

The selection of study sites was guided by geographical, ecological and occupational considerations, in order to explore factors that might effect differences in *ganja*-related behavior. Seven communities were finally selected for in-depth study for periods of about six months. Three are in the southern half of the island – one in the southwestern parish of Westmoreland, one in the central parish of Manchester, another, a working-class neighborhood of the Kingston-St. Andrew Corporate Area; and four are settlements in the southwestern parishes. Five are typically rural, differing somewhat in topographical and occupational characteristics. Two of these five are hill communities in the interior, dependent on small-scale
cultivation; and three are coastal settlements, one composed of fishermen and farmers, another of agricultural laborers tied to sugar estates, and the third a fishing community in which construction workers for a bauxite company have recently settled. Of the remaining two, one is a quasi-urban parochial capital with administrative and commercial functions, and the other is a lower-class neighborhood that is the quintessence of the Jamaican urban condition.

The seven project sites provided a comprehensive view of the extent, pattern and variety of ganja use by the working class. It was beyond the resources of the project to study the influence of American tourists on indigenous patterns of ganja use and distribution or to undertake extensive studies of the urban areas. Despite these lacunae, findings from the seven project sites provide a representative outline of ganja use for the majority of the Jamaican working-class.

After an anthropological analysis of the background of the ganja complex and of the sociocultural context of ganja use in Jamaica, the results of clinical studies are presented. Background analyses include a discussion of the ethnohistory of the introduction of ganja to Jamaica and of the history of ganja legislation, dating back to 1913. A chapter is devoted to the description of the ganja complex itself and another to the results of the study of the acute effects of smoking ganja in a rural, agricultural community.

The clinical studies of the effects of chronic smoking were undertaken by the Faculty of Medicine of the University of the West Indies and by the staff of the University Hospital. Sixty adult working-class males, 30 ganja smokers and 30 non-smokers, matched for age, socioeconomic status and residence, were selected from four of the seven communities. All were admitted to the University Hospital for six consecutive days of wide-ranging examinations. Detailed medical histories were taken, and examination and testing included radiology of heart and lungs, ECGs, respiratory function, hematologic and treponemal serology, and chromosome studies. Blood and urine samples were sent to the United States for analysis of peripheral thyroid hormone levels and steroid excretion. Samples of ganja submitted by smoker subjects were also sent to laboratories in the United States for THC analysis.

Psychiatric assessment was based on life histories, a series of
standard but somewhat modified international questionnaires and interviews which incorporated questions about attitudes toward ganja and smoking history. Electroencephalograph studies, including a substudy of sleep recordings, were conducted by the psychiatric staff. The battery of 19 psychological tests administered included one personality test, three tests of intellectual and verbal abilities and 15 neuropsychological tests.

Finally, the expectations and reactions of the smoker subjects to ganja are presented and their attitudes about the use of ganja compared with those of non-smokers. Psychosocial predispositions that underlie becoming — or not becoming — a regular smoker are examined and cultural factors conditioning reactions to cannabis are explored. While the volume deals essentially with the sociocultural context of ganja use in Jamaica, comparisons are made with the use of marijuana in the United States.
Notes on the ethnohistory of cannabis

Man’s use of psychoactive and psychotropic plants is very ancient, probably predating plant domestication. Cannabis, known as marihuana, *dagga*, *kanebosom*, *kif*, *maconha* and *ganja*, among other terms, is one of the most familiar of these plants. The use of cannabis for its psychoactive properties has become extraordinarily widespread and appears, apart from caffeine and tobacco, to be second only to alcohol in worldwide popularity. The number of estimated users throughout the world in 1969 was between 200 and 250 million (Brecher *et al.* 1972:402).

The popularity of marihuana as a consumer product has led to a broad range of studies in biochemistry and botany as well as other fields, frequently engendering scientific controversies. There has been considerable controversy, for example, over whether there is more than one species of cannabis, with different biochemical components. For some time it has been generally accepted that there is a single species, *Cannabis sativa*, classified by Linnaeus in 1753 (Schultes 1970; Doorenbos *et al.* 1971). Botanical variations within the species were attributed by Richard Schultes to the “diversity of its utilitarian interest to man, that has been responsible, perhaps more than any other circumstance, for the extraordinary differentiation of the species into so many races or strains throughout its long association with the human race” (1970:12).

The orthodox monotypic concept has recently been re-examined by Schultes *et al.* (1974) who propose that the genus is polytypic, as indicated by Lamarck’s recognition in 1783 of *Cannabis indica* as a distinct species and the examination of modern Russian
sources, previously overlooked in the literature, which offered the view for the first time that “there are indeed several species of cannabis ... on the basis of studies and experience in the field” (341).1 Further, the authors note that “throughout the modern Russian literature there exists the inference, if not the outright claim, that the cannabinolic content of Cannabis indica is higher than that of Cannabis sativa and Cannabis ruderalis” (358). Consequently reference is made to the plant throughout the text simply as cannabis.

One of the oldest known multi-purpose plants, cannabis has had a divergent ethnohistorical course, in differing civilizations and societies. The available evidence on the diffusion of cannabis indicates that it originated in central Asia, possibly in the Himalayas, and that there have been marked sociocultural differences not only in the primary uses of the plant – for manufacturing, magicoreligious, medicinal, psychoactive and even dietary purposes – but also in the context of its use. References to cannabis appear in pharmaceutical and religious works of the early civilizations of China and India. Burnt cannabis seed has been found in ancient Scythian bronze vessels.2 The Old Testament refers to it, the root term kan occurring in the original Hebrew text and its Aramaic translation.3 And there is historical and literary mention of its use in ancient Rome.

Although cannabis has been alternately praised and attacked for its reputed attributes and effects, its use has endured in a remarkable variety of ways. Public attention has been focused on its psychoactive properties, but cannabis is “an unusually valuable economic plant” the source of hemp as well as of hashish. Extremely complex botanically, cannabis yields a variety of products. The fiber provides

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1. Cannabis came to be known as Indian hemp among European botanists, but the Linnaean classification of Cannabis sativa, as a monotypic genus, has been the generally accepted view. William Stearn, who examined the specimens Linnaeus used, still available at the Herbarium of the British Museum of Natural History, notes that Linnaeus “based his original description on the hemp grown in northern Europe in 1737, which he knew in a living state; this hemp belonged to the long-cultivated European stock which Rabelais had described at length in 1545 under the fictitious name ‘Pantagruelian’” (Stearn 1974: 335–336).

2. Reported by S.I. Rudenko, the Soviet archaeologist. This corroborates the report by Herodotus (c. 450 B.C.) of Scythian use of hemp seed for vapor baths in funerary purification rites (Embdon 1972: 223).

3. Benet notes that kane is mentioned in the Old Testament as an ingredient of incense in ancient Palestine (Benet 1974).
“true hemp, strong and durable,” used for rope, twine, the manufacture of cloth and as a pulp in paper production. Its oil is used in paints, varnish and soapmaking, the oil cake providing cattle feed. The seeds have been traditionally used in soups and porridge, the leaves in medicinal teas and infusions. The resin of the plant, “produced on glandular hairs on the leaves, stems and inflorescences,” contains the psychoactive properties (Schultes 1970:11, 13).

The earliest use of cannabis for fibers⁴ may have been followed by magico-religious and medical use of the resins. The economic value of cannabis – a tenacious plant that “will smother all weeds” (Haney and Bazzaz 1970:41) – is enhanced by its “almost unique geographic and climatic adaptability over a large part of the world” (Schultes 1970:19).

Since cannabis originated in central Asia, it is one of the few psychoactive plants not indigenous to the New World.⁵ It was gradually diffused through trade routes from Asia until it reached Europe,⁶ to be used there initially for the production of rope and textiles. Eventually it was carried to the New World by the Spanish conquistadors about 1545 for the manufacture of cordage and fibers and brought to the British colonies of North America in the

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⁴ Probably man’s oldest cultivated source of fiber, there is evidence from China and Chinese Turkistan “that nearly 5000 years ago, Neolithic man made thread and rope from hemp” (Schultes 1973:59).

⁵ Lévi-Strauss observed that “few primitive people have acquired as complete a knowledge of the physical and chemical properties of their botanical environment as the South American Indian” (1950:484). Nearly a hundred different native botanical species with psychoactive properties were utilized by American Indians for ritual and medicinal purposes, in addition to the ritual use of tobacco and fermented beverages made from plants. Knowledge of psychoactive plant properties and the techniques for preparing them may have been introduced by Paleolithic immigrants to North America (Furst 1972). Cannabis, however, was not native to the Western Hemisphere. S. Henry Wassén notes: “As far as I know any use of cannabis sativa indica [sic] must have been a post-Columbian introduction to South America” (1972:21).

⁶ Documentation is becoming available of the early multipurpose use of cannabis in eastern Europe. Cultivation of cannabis in southern Russia, which eventually became the leading world manufacturer of hemp rope, goes back to the seventh century B.C. While manufactures were probably the primary commercial consideration, cannabis was also traditionally used in folk medicine for its analgesic and antibiotic effects. Hemp “porridge” was a common food in eastern Europe, and soups and juices made of hemp seeds are reported to have been served in medieval monasteries. There is also archaeological evidence of their ancient use for ritual purposes (Benetowa 1936, Kabelik 1955, Benet 1974).
early seventeenth century. Green and Miller (1974) note that "the history of cannabis in North America began in 1606 with experimental cultivation in Nova Scotia (then Nova Francia) by Louis Hébert, who was Samuel de Champlain's apothecary; "soon after" commercial cultivation was established throughout both French and English New World colonies.

The New World settlers cultivated the plant as a source of hemp for the manufacture of cloth, twine, rope and other products vital to European shipping. Hemp cultivation was part of the English settlers' contract with the Virginia Company; under this agreement the first crop was planted in Jamestown in 1611. There can be no doubt that the early hemp industry in America was a "compulsory inheritance from the mother country" (Grinspoon 1971:11). Britain encouraged its cultivation in the colonies to overcome Russia's monopoly of hemp production, to stimulate mercantilist activity in the triangular trade and to maintain British maritime primacy. Hemp, consequently, was an important plantation crop even after Independence and was an export crop until cotton replaced it when Whitney's cotton gin came into common use.

Despite man's long association with cannabis, not all its various uses were introduced together into the Western world; for example, hemp as a source of fibers has been known much longer in North America than the relatively late use of cannabis for psychoactive purposes. Knowledge of the properties of cannabis for magick-religious and medicinal purposes was part of an early but limited stream of diffusion which slowly reached the West. The earliest recorded medical use of the plant occurs in a Chinese pharmaco-

7. It was also introduced to the Portuguese areas of South America about this time (Hutchinson 1974).


9. Metropolitan ships engaged in the triangular trade of slavery carried cloth, trinkets and the like, and firearms to the African coast to be exchanged for a "cargo" of slaves for sale in the West Indies. On the return journey the ships carried sugar and other raw products from the colonies to metropolitan centers in Europe.

10. The use of cannabis for medicinal purposes has been attributed to George Washington, on the basis of very slight evidence (Andrews and Vinkenoog 1968:34).
poeia, c. 2700 B.C. (Fort 1968; Emboden 1972); its use as an anesthetic in surgery was also reported in China in the sixth century B.C. (Great Britain 1969; Emboden 1972). Cannabis was known in India for its "stimulating and euphoric properties," was mentioned as a "sacred grass" in the Atharva Veda (2000–1400 B.C.), the earliest recorded reference in Hindu writings (Chopra 1969); and was used in ancient Hindu medicine as a nostrum for a wide range of complaints. It was closely associated with ritual and provided the basis for a restorative and refreshing drink called bhang11 still commonly taken in India. Bhang, a Hindi term derived from the Sanskrit bhanga, is probably the earliest form of cannabis use, although the smoking and eating of the plant are, from all accounts, also centuries-old practices in India.

The use of cannabis chiefly in rituals and as medicine in India may have been governed by ecological as well as cultural factors, the climate of the Indian subcontinent not being as favorable as that of Europe for production of good quality flax and hemp. Perhaps partly because of the European focus on its value in manufacture, it was apparently not until the mid-nineteenth century that most of the Western world discovered that the plant from which it produced hemp products also possessed therapeutic and psychoactive properties.12

An 1842 report by Dr. W.B. O'Shaughnessy, who had served in India, stimulated Western interest in the therapeutic value of cannabis. In 1845, J.J. Moreau de Tours, a French physician who conducted experiments with the plant, proposed its use in the treatment of melancholia, idée fixe, hypomania and chronic mental illness. Between 1842 and 1900, more than 100 reports appeared in medical journals, recommending cannabis for the treatment of various somatic and psychic complaints. An article in Lancet in 1890, by Dr J.R. Reynolds, a Fellow of the Royal Society who had been using cannabis in his practice for 30 years, recommended it for depression, dysmenorrhea, certain epileptoid states, migraine, cer-

11. Bhang is prepared by drying and pounding the cut tops of cannabis and infusing them in water, to which spices are added.

12. Doorenbos et al. note that "Environmental factors... are not as important as heredity in determining the cannabinoid content of harvested marijuana, contrary to the widespread belief that warmer and sunnier climates produce the most potent marijuana a" (1971:9).
tain neuralgias and senile insomnia. Dr. Reynolds suggested that active plant materials be used for effective treatment and the gradual determination of appropriate dosage for each patient to avoid toxicity. In 1898, Sir William Osler recommended cannabis as “probably the most satisfactory remedy” for migraine (Grinspoon 1971:225, 221, 220).

Extractum cannabis was first listed in The Pharmacopoeia of the United States in 1850 and the listing was continued until 1942. However, considerable controversy about its effective use in medicine arose from problems of standardization and suitable forms of administration.13 Nevertheless, with some experimentation, cannabis became well established in Western medicine for the treatment of both organic and mental illnesses; by the turn of the century, however, new synthetic drugs which were more efficient to prescribe and administer began to replace cannabis. The Marihuana Tax Act of 1937 effectively put an end to its medical use in the United States.

The West probably became aware of the psychoactive properties of cannabis by several routes. Crusaders may have learned of hashish during the Middle Ages, and Napoleon’s soldiers may have brought hashish home after the Egyptian campaign of 1798.14 Most likely as a result of the Napoleonic campaign, by the mid-nineteenth century, hashish had become famous in literary and artistic circles through the writings of members of Le Club des Hachichins, founded in Paris by the poets Baudelaire and Gautier, both of whom vividly described fantastic hallucinatory experiences attributed to “the greenish paste.” While Dr. Moreau de Tours, also a member of the club, became interested in cannabis for the treatment of mental illness, the primary interest of the writers was in the hashish experience as a key to paradise. Other drugs, however, were sometimes mixed with the hashish, and it is impossible to unravel whether the

13. Cannabis is not water soluble, and dosage of the plant was difficult to control and to administer, either orally or through the newly developed hypodermic syringe.

14. The crusader route might have accounted for Rabelais’ familiarity with the various properties of the plant, fictionalized as “the plant Pantagruelion” in his history of Pantagruel (1532–52). Rabelais, a physician whose father “grew much hemp on his property” (Stearn 1974), seems to have had a presentiment of the antibacterial qualities of cannabis recently reported by Yugoslavian researchers (cited in U.S. DHEW 1972:143) and by Czechoslovakian researchers (Kabelik 1955).
reactions reported were based on overindulgence in hashish, alcohol or opium (Grinspoon 1971:83). This European hashish-cum-literary movement apparently did little to stimulate psychotropic use of cannabis in the Americas, other than in the writings of Fitzhugh Ludlow. Also influenced by De Quincey’s Conessions of an Opium Eater and steeped in the Thousand and One Nights, Ludlow wrote of his equally fantastic experiences in The Hasheesh Eater (1857). His writings seem to have been accepted in the United States as fanciful tales, in the vein of the Arabian Nights, and did not influence the spread of hashish as a key to paradise.

Cannabis use in the United States in the form of hashish was occasionally intimated, for example, in the Scientific American in 1869: “The drug hashish, the cannabis indica of the U.S. pharmacopoeia, the resinous product of hemp, grown in the East Indies and other parts of Asia, is used in those countries to a large extent for its intoxicating properties and is doubtless used in this country for the same purpose to a limited extent.” Other news accounts toward the end of the century indicated “the occasional use of cannabis for recreational purposes … limited, local and temporary” (Brecher et al. 1972:407, 409). Generally, though, “the hallucinations and disturbances of time sense sought and reported by Le Club des Hachichins of Baudelaire and Gautier are avoided by most users elsewhere” (Murphy 1963:16; see also WHO 1971:32).

Many of the hundreds of New World plants were introduced to Europe in the post-Columbian period and were incorporated into the European pharmacopoeia, but cannabis was not among them, as it is not native to the Western Hemisphere. Nevertheless, some Jamaican users believe that the plant was native to the island and was used by the aboriginal Arawaks. Others believe it was brought from Africa, and many believe it is of divine origin. The first botanical reference to Cannabis sativa in Jamaica appeared in an appendix to Bryan Edwards’ comprehensive history of the British colonies in the West Indies (1807), which was first published in 1793.

15. On his first voyage, Columbus found the Arawak on Hispaniola using tobacco and cohoba. Tobacco was a sacred plant and cohoba (Piptadenia peregrina) was taken ceremonially as a hallucinogenic snuff; infusions of cohoba seeds were also used medicinally (Safford 1916:396–399). Beaubrun notes that the Caribbean cohoba bean (containing hydroxide bufotenime) is chewed to produce religious visions (1971:4).
The appendix, *Hortus Eastensis*, is a *Catalogue of Exotic Plants* in the botanical garden of Hinton East, which was bequeathed to the public. The catalogue lists cannabis simply as hemp—origin, India.\(^{16}\) Hemp was never an important commercial crop in colonial Jamaica,\(^ {17}\) nor has any record of colonial medicinal use come to light.

Various ethnohistorical clues to the multipurpose adoption of cannabis in Jamaica have been investigated, starting with the period of slavery, since it is generally believed that the psychoactive use of cannabis was introduced to the West Indies by African slaves. And it is likely that its multipurpose use spread by way of Arab traders to Africa before European colonization, possibly along the Mozambique coast, then spreading inland (Brecher et al. 1972:398; du Toit 1974; Watt 1973).\(^ {18}\) It may conceivably have been introduced to the West Indies during the slave trade; no evidence however, has been uncovered of cannabis use for its therapeutic or psychoactive properties by African slaves, or by freedmen, in the Antilles during the pre-emancipation period. There is mention in the literature of this period of tobacco, alcohol, coffee, laudanum and some native plants, with poisonous or narcotic properties, such as the myal plant,\(^ {19}\) but there is no mention of cannabis.

Strong circumstantial evidence suggests that the multipurpose use of cannabis was introduced to the British West Indies by indentured laborers from India, the first of whom arrived in

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\(^{16}\) The donor of the plant was M. Wallen, Esq. (no date). Other plants credited to Wallen are dated 1772–1785 (Edwards 1807:404).

\(^{17}\) Gardner notes that “a 100 lb. premium was offered for a ton weight of really good substitute for hemp” (1971:328). This was probably in 1826. Mme. Lucille Barash of the Canadian Commission of Inquiry into the Non-Medical Use of Drugs reports that a Russian hemp expert, brought to Canada in 1792 to improve hemp production and to Jamaica around 1800 to test production possibilities, reported failure in Jamaica “from the point of view of fibres too fine for cordage in Jamaica, from the same seeds as grew well in Canada,” so commercial cultivation was abandoned (personal communication). As previously noted, Russia was the leading world producer of hemp at the time.

\(^{18}\) Other reports indicate that “use of cannabis in most parts of Africa developed slowly, most of it during the past 100 years” (cited in National Commission v.I, 1972:11), however, recent archaeological finds in Ethiopia (van der Merwe 1974) confirm earlier use.

\(^{19}\) This plant was used in Jamaica by the Myal cult to induce a deep trance in subjects as a demonstration of their ability to act out the event of “death and resurrection” (Patterson 1967:188). It may be branched *calalu* or *solannum* (*Solanum nigru L. Solanaceal*) (Gardner 1971:191; Asprey and Thornton 1954:22).
Trinidad and Guiana in 1844 and in Jamaica in 1845. First, there is lack of evidence of cannabis use for smoking or folk medicine before 1845. Secondly, the Hindi word for cannabis, *ganja*, is the prevalent working-class term, used even in Jamaican legislation. Other Hindi terms related to cannabis are also common in Jamaica, including *chillum* pipe, and *kali*. On the other hand, African terms for cannabis such as *dagga* and *kif* are not in folk use.

Most significantly, the complex of cultural beliefs that is linked with cannabis among working-class users in Jamaica parallels that of India. This includes the methods of preparation and use, the role of *ganja* in folk medicine, in divine origin mythology, in pragmatic and ritual uses and the social class framework of use and attitudes toward *ganja*. The *ganja* complex is a cultural innovation from the period of East Indian indenture, diffused to the black cane cutters through association with indentured workers on the sugar plantations and incorporated into working-class life styles.

The relationship between the *ganja* complex in India and Jamaica can be seen in the report of the Indian Hemp Drugs Commission, appointed by the British Government in 1893 to inquire into, and report on, the cultivation of, and trade in, all preparation of hemp drugs in Bengal, the effect of their consumption upon the social and moral condition of the people, and the desirability of prohibiting its growth and sale (Great Britain 1969:1). The Commission took testimony from 1,193 witnesses and examined the records of every mental hospital, since the presumed high incidence of so-called "*ganja* mania" in Indian lunatic asylums was one of the factors that prompted the appointment of the Commission. Much of the testimony was elicited by a carefully detailed questionnaire.

20. The report of the "Russian expert" in 1800, that the fibers of cannabis grown in Jamaica were "too fine for cordage" did not preclude the use of cannabis for other purposes.

21. Approximately 36,000 East Indians came to Jamaica in the period between 1845 and 1917. It is estimated that only about 18,000 remained when indenture ended (Cumper 1954).

22. Broadening scientific and public interest in marijuana led to the uncovering of the report of the Indian Hemp Drugs Commission, first published in 1894. The report, "which remains today by far the most complete collection of information on marijuana in existence" (see Kaplan in introduction to Great Britain 1969:vi) was virtually unknown (and unavailable) for about 75 years. It was reprinted in 1969 in a one-volume edition (six volumes of appendices were not included) edited by Dr. John Kaplan, Professor of Law at Stanford University.
covering most of the issues still being debated in the current literature and by present-day legislatures. The findings of the Commission have been of landmark value and have provided major clues to the relationship of the ganja complex in Jamaica to that in India.

Cannabis has been a household remedy in India since ancient times. Dispensed by native doctors, it has been one of the most important drugs in the Indian materia medica. It has been used as a poultice for wounds, as a prophylactic against malaria, as a cure for leprosy, as a vermifuge, and to “correct derangements of the humours.” Indian medical works dating back to 1300 A.D. also list among the effects of cannabis that it “sharpens the memory,” “sharpens the wits,” “creates energy,” and “stimulates mental powers” and is an elixir vitae. Commission witnesses testified that cannabis is “refreshing and stimulating,” alleviates fatigue, creates the capacity for hard work and the ability to concentrate, and gives rise to pleasurable sensations, so that one is “at peace with everybody” (Great Britain 1969: 174-175, 191-192).

According to Hindu mythology, cannabis is a holy plant, given to man for “the welfare of mankind,” and Moslems as well as Hindus share the belief that ganja is “a holy plant” (Chopra 1969: 216-218). Witnesses before the Commission reiterated the ancient belief that ganja has divine properties, brought from the Himalayas by Shiva, the Hindu deity. Shiva worshippers invoke the deity in special prayers before ganja is taken. Although the holy books, the Shastras, forbid worship of the plant, it is venerated and used as a sacrifice to the deities. Cannabis is used in worship and in offerings made on the fulfillment of vows and bhang is customarily served at weddings and at religious festivals (Great Britain 1969: 159-165). Bhang is also taken in a beverage called thandaii and served as a sweetmeat and is sometimes used in urban areas in making ice cream (Hasan 1974). Ubiquitous overt use of ganja for secular purposes, particularly smoking, was confined to the lower class and was most extensively used “among the poorer sections of the population” (Chopra 1969: 227).

The large group of witnesses who testified before the Commission

23. Cannabis is offered to Shiva during temple worship on Shivaratri day as “food of the gods” (Hasan 1974).
presented both favorable and adverse views of the observed, or alleged, effects of cannabis. Some of the testimony was seemingly contradictory, for example, that it stimulated appetite, and that it allayed hunger. And there were differences of opinion as to the beneficial or evil behavioral effects. Disapproval of the use of cannabis, however, was largely linked to social position. Witnesses stated that its “use is confined to lower-class people,” who are treated by the educated “higher-class” people with disrespect and referred to as ganjari, a term of contempt, like “drunkard.” One witness stated that the “good cultivating farmer caste” never used ganja or bhang as a stimulant to hard work but increased the consumption of ghee and milk for increased energy. It is interesting to note that the use of opium by the “higher-classes” was not considered socially inappropriate (Great Britain 1969:195–196, 400–405).

Adverse witnesses correlated the use of cannabis with dissipation, debauchery, crime, violence, disease and insanity. Investigation by the Commission of the “very sketchy” records of lunatic asylums, however, led to the recognition that it was an ordinary practice “to enter hemp drugs as the cause of insanity where it has been shown that the patient used these drugs.” It was found that the reported “cause of insanity” in lunatic asylum records was often changed from “unknown” to “ganja smoking.” Statements of cause of insanity were supplied by magistrates or the police, and the alleged “lunatics” were “generally wanderers.” The Commission found only a very small percentage of cases in which “hemp drugs might be reasonably regarded as a factor causing insanity.” Even in these cases, the Commission found “nothing typical in the symptomatology of ‘hemp drugs mania’ different than that in mania due to other causes” (Great Britain 1969:207, 230–236, 247).

It has been observed that “marijuana-growing and its consumption probably reached its greatest efflorescence” in India] (Goode 1969:6). In Jamaica today, many of the Indian features of the ganja complex persist. The grades used, linguistic terms,24 methods

24. In India there are three grades of cannabis, varying in pharmacological intensity: charas, the most potent; ganja, the second grade; and bhang, the mildest form. Jamaicans use the term kali rather than charas for the most potent grade. Kali is the Hindi term for buds and was undoubtedly adopted from the East Indians. The word is also Swahali for “strong,” “sharp,” but Jamaican usage is probably independent of this.
of preparation and consumption, prevalent use in the folk pharmacopoeia as a universal nostrum, pervasive folk beliefs in the properties of *ganja* as stimulant and sedative, as an energizer and as an assuager, as having divine origin and the source of "wisdom" and of "peace," as sacred and secular, are found in the *ganja* complex in Jamaica, discussed at length in Chapter IV. As will be seen throughout this study, striking similarities exist between these features of the contemporary *ganja* complex in Jamaica and the descriptions reported by the Indian Hemp Drugs Commission in 1894: striking similarities in the alleged attributes of cannabis, in cultural beliefs, in the social class clustering of attitudes and users and in their influence on legislation.
CHAPTER III

Ganja legislation

The ethnobotanical antiquity of cannabis contrasts sharply with the relative recency of its legal history. It was not until the twentieth century that legal proscriptions against cannabis became commonplace. Almost universally, the introduction and subsequent development of the codes rested not on objective knowledge of the plant but on a welter of often tangential social factors and problems. The development of Jamaican cannabis laws, dealt with in this chapter, provides one example of how a rigid social system (based on plantation economy), historical accidents (such as the importation of East Indian laborers), class biases, external influences, political expediency and limited knowledge about cannabis and its effects led to increasingly stringent and punitive measures against its use.

Cannabis in Jamaica, legally referred to as ganja, has been subject to various forms of prohibitions for over sixty years. From a review of departmental reports, Legislative Council minutes, Governor’s reports, colonial reports and newspaper accounts, there is nothing to indicate that ganja was considered a major social issue in Jamaica until the turn of the century. The first official mention of ganja appeared in the report of the lunatic asylum for 1883-84, which gave “gonja” smoking as the probable cause of lunacy for one person admitted that year. The 1892-93 report of the Protector of Immigrants (i.e., East Indian indentured laborers) mentioned that East Indians were believed to be using ganja. However, there was no reference to ganja in the 1896 debate over the Lunatic Asylum Law.

Over the years, a few more patients whose condition was attri-
buted to ganja were admitted to the asylum: two in 1905–06, four in 1907–08, two in 1909–10, six in 1910–11; but not until the lunatic asylum report for 1911–12 is there evidence of growing concern, particularly among church groups, about ganja smoking:

Three admissions to the asylum were attributed to ganja smoking, which confirms the opinion expressed by the Council of Evangelical Churches that ganja smoking is spreading among the natives of the island, and that proper steps should be taken to suppress the cultivation and sale of the plant.

The Council of Evangelical Churches at this time, through a Mr. Haggart, elected member for the parish of St. Andrew, presented to the Legislative Council a petition against ganja smoking. The motion was defeated, but in the following year, 1913, the Legislative Council acted, presumably inspired by a lengthy editorial in the influential Daily Gleaner entitled “Ganja Smoking as a Danger to the Natives of this Colony” (reprinted in Appendix I), which referred to the “considerable concern” among the Jamaican planter class and went on to allege that ganja was having a demoralizing, criminogenic influence on coolie (East Indian) laborers.

The ganja issue was raised in the Legislative Council during debate over the International Opium Convention signed at The Hague in the previous year, which British overseas territories were invited to ratify. Jamaica amended its consenting document, adding prohibitions against the importation and cultivation of Cannabis sativa. Following is an excerpt of the Daily Chronicle report on the debate, revealing ambivalence among the legislators:

Ganjah [sic] rendered men incapable of working and while under its influence they might commit a crime almost without their own knowledge. The habit had so far taken hold of the native population that one now found the native(s) giving up their seductive tobacco for ganjah. It was having a very bad effect on them.

The Colonial Secretary said, that honourable members thought ganjah most dangerous as compared with other drugs; but an analysis of it had been made in India and it was found to be one of the least dangerous.

Mr. Simpson said it might be the least of the evils they had in India, but taken by itself it might still be a most terrible
evil. It was certainly something which the Government should take up.

Mr. Stedman said reports of the Lunatic Asylum authorities and the Police Department had stated that as a result of the ganjah habit, crime had been increased. Employers of coolie labour should be allowed to destroy all trees of this description found growing on their estates.

Mr. Evans supported the views of Mr. Stedman. He had personal knowledge of the harmful effects of ganjah smoking, for he had coolies under him and often had to threaten them for the habit.

The Attorney General asked if there was any large importation of ganjah here, and the Collector General assured him that there was.

Mr. Corinaldi said the coolies were entitled to the use of their own peculiar form of smoking, just as hon. members were entitled to their cigars.

It was agreed to include ganjah in the Bill.

Under the cover of the International Opium Convention, the first ordinance against the cultivation and importation of Cannabis sativa in Jamaica was passed, but possession and use were not specified as criminal acts. Offences were punishable by fines not to exceed £100, and, in default of payment, by imprisonment, with or without hard labor, for a period not to exceed 12 months. For a summarization of ganja laws in Jamaica, 1913–72, see Appendix II.

Despite the presentation of the benign findings of the Indian Hemp Commission of 1893–94 and the disapproval of English colonial officials in Jamaica, the cover of ratifying a prestigious international convention permitted the passage of the amending ganja clause dealing with an issue that seemed more important than opium to the legislators. The underlying reasons for this legislation were much the same as those which influenced other security legislation. Adolf Edwards, a Jamaican legal scholar, asserted that proposed legislation to deal with irregular military drilling, the practice of obeah,¹ and seditious language, around the turn of the century, was largely motivated by the fears of planters that the

¹ Magical practices of African origin, still widely current in Jamaica and other parts of the Caribbean.
masses would successfully revolt. A study by Sir Charles Jeffries suggests, in the same vein, that the early establishment of the Jamaican police force was prompted by fear of the black laboring population.

The abolition of slavery created a proletariat politically free but uneducated and to a large extent "left to shift for themselves without the support of traditions of self-help or mutual cooperation...". The establishment of organized police forces was in the first instance due to a well-justified fear on the part of the governing class that the existence of this mass of unstable, excitable, ignorant and discontented people offered a serious threat to law and order (1952:60).

Local legislatures, dominated by the plantocracy, attempted to deal with social problems mainly by repressive control, without taking measures to improve the socioeconomic health of the colony. This policy was justified, as slavery had been justified, on the grounds that these were "inferior" human beings for whom harsh laws and penalties were necessary. In this context, fears of mass uprising were very real. However, legislation enacted in colonial Jamaica had to be approved in London, where many of the blatantly punitive measures were rejected.

In 1924, a new Dangerous Drugs Law was enacted, which revised the penalty to six months maximum imprisonment, on a first conviction for cultivation, possession, sale or smoking of ganja and/or a fine of up to £ 100, two years maximum imprisonment and/or a fine of up to £ 250 on the second conviction. This law remained in force until 1941, when penalties were made even more severe.

In the meantime, in 1937, the Marihuana Tax, the first federal prohibition of marihuana, was passed in Washington, D.C., following a publicity campaign by the United States Bureau of Narcotics in which the effects of marihuana were presented as debilitating and sometimes horrifying (Becker 1963). The propaganda out of Washington provoked new public concern in Jamaica, intensified by the rise of Rastafarianism among the island's lower-class blacks.2

2. During the anti-marihuana campaign in the United States, public concern about the effects of ganja intensified in Jamaica. This concern was associated with the rise of Rastafarianism, a set of beliefs held by some lower-
In addition, in 1938, during the Great Depression, in which there were failures in the sugar industry, economic distress erupted in massive demonstrations. This complex of circumstances—a firm intention to maintain order, a possible carry-over of lurid North American publicity and Rastafarian-associated antagonism—led to a 1941 revision of the Dangerous Drugs Law. The penalty for a first conviction (possession, sale or cultivation of ganja) was increased to a mandatory maximum imprisonment of one year without option of a fine, but with the possibility of a fine up to £100 in addition; and for a second conviction, imprisonment of up to two years without option and liability of a fine up to £250.

The 1941 amendment incorporated, for the first time in Jamaican jurisprudence, the principle of mandatory imprisonment. No longer did a judge have the option of jailing or not jailing a convicted ganja offender: conviction automatically meant imprisonment. In addition, possession of any amount of ganja, no matter how small, was taken to imply possible intent to sell. For example, if a man had just lit a spliff, he was liable to a lesser penalty for smoking; but

3. Spliff (sometimes called "skiff") is the ganja cigarette or cigar, the Jamaican equivalent of the American "reefer" or "joint." Spliffs are rolled by hand in any
if he had not yet lit it, he was liable to a much heavier penalty for possession. The police had discretionary powers in the type of arrest they could make. A constable might allege possession if he wished to make certain that a given suspect, if convicted, would be sentenced to a much longer period of imprisonment; or he might bring a charge of “preparing ganja for export” rather than possession to ensure a lesser penalty. The theoretical impartiality of law was thus corrupted.

Soon after World War II, ganja became a major, sustained topic of police and public concern. Commissioner of Police T. Calver issued a report for 1949–50 that associated ganja with crime:

It is suggested with some justification that the use of Ganja has some connection with the prevalence of crime. Comment has recently been made in the press on this subject ... An attempt has been made to compare Ganja trafficking statistics with cases of sexual assault on women and girls, also with offences against the person, of robbery and larceny from the person. Comparison of such offences is difficult because the Ganja statistics are only of those recorded as a result of positive police action.

However, they indicate an affinity between the smoking of Ganja and the rise and fall of crimes ...

A serious case in point is that of a sexual assault (rape) by four or more youths on one woman. During this series of assaults, they were all or at least some of them smoking Ganja.

Calver’s “serious case in point” was a quick way of marshaling public opinion, even as the United States Bureau of Narcotics had published lurid cases in 1937. The Calver period was marked by intense police and newspaper campaigns against ganja, but despite cash inducements to encourage informers, the public appears to have given the police little support. Calver’s tenure ended in 1953 and, coinciding with an improved economic situation, ganja kind of paper wrapping, though it is usually brown bag paper. It may contain various amounts of ganja mixed with tobacco. Conical in shape, the spliff is about four inches in length, and twisted at the thicker end. The pointed end is held in the mouth and the spliff is generally up-tilted to prevent the ganja-tobacco blend from falling out. Each inhalation is called a "draw," though this term is sometimes used to refer to the smoking of the entire spliff.
was not reported again as a major police problem until 1961. Jamaica experienced a minor economic boom with the expansion of the bauxite mining operations in the latter part of the 1950s. Reported crime rates reached their lowest level for the century, and a generally optimistic atmosphere seems to have prevailed throughout the society with little complaint about deviant or criminal behavior. In this state of relative well-being, the Dangerous Drugs Law remained unchanged until 1961, the year before Jamaica gained independence.

As a result of a startling political event leading to civil disorder in 1960, *ganja* once again came to the fore as a serious issue. Several British soldiers were killed during an insurrection of a *ganja*-using religious group led by Claudius Henry, supported by a small number of North Americans. Large-scale police action led to the break up of the group, and Henry was convicted of treason. The press and much of the public associated the disorders with the use of *ganja*, and at the end of the year the Dangerous Drugs Law was again amended. During the debate, the Minister of Home Affairs argued that *ganja* was being grown on a very wide scale, that he suspected a substantial export trade and that

The police are convinced that 50 to 75 percent of crimes of a violent nature are the direct result of *ganja* smoking .... That, to my mind, is the most important aspect of this, that people who smoke *ganja*, granted they might have criminal tendencies due to previous causes, the fact is that these people with these tendencies get *ganja* and become dangerous.

The amendment made offenses of growing, selling or otherwise dealing in *ganja* subject to trial on indictment, with obligatory imprisonment up to a maximum of five years and the additional possibility of an unlimited fine. It may be noted that the penalty for possession remained at obligatory imprisonment of up to a maximum of one year, plus a possible fine of up to £100, on first conviction, while the penalty for smoking remained as an option of up to one year's imprisonment or up to £100 fine, or both.

During this period, the Jamaican Government was led by Norman Manley of the People's National Party (PNP). While the Jamaica Labour Party (JLP) opposition (which was to introduce even more severe legislation when it came to power) agreed that there was
a need for firmer laws, it criticized the Government for only expressing opinions about ganja effects and increase in use without presenting evidence to support the amendment and requesting studies on the subject. The Minister of Home Affairs replied:

I am not here to argue any scientific data on the subject but there can be no doubt that marihuana in the United States is considered as a pernicious element. There can be no doubt that the British government thinks the same.

Government officials indicated that they were under international pressure to control ganja and that foreign relations would be damaged if the purported export traffic were allowed to continue. The Minister of Health summed up the alleged behavioral effects by asserting:

If a criminally-minded person has an idea of doing harm, or bodily injury to another, he would not do it, because he knows it is wrong, and he knows the law of the country, but when he is under the influence of ganja he feels his strength, or courage, and he would go right ahead and do that wrong on account of the lapse that takes place when he is under this drug.

He contended that Jamaica must respect the International Conventions signed at The Hague in 1912 and in Geneva in 1931, when “we had definite scientific knowledge as to the facts of ganja.” Though he said that adverse scientific evidence had been gathered since that time, he did not cite any in the debate and was challenged. While police statistics, introduced in support of increases in ganja offenses, did little to bolster the Government case, members of the Jamaica Labour Party generally accepted the need for further deterrence. Only two Opposition objections roused heated debate: that there could be illicit “planting” of ganja on an individual and that the police could make false allegations as a pretext for search.

Both the 1941 and 1961 amendments, which carried increasingly severe penalties, came at points in Jamaican history when there was either economic or political unrest and when there was fear of supposedly militant lower-class elements, such as the Rastafari and the group led by the Reverend Claudius Henry, who, like many in the lower classes of Jamaican society, smoked ganja.

Following a short-lived period of federation with other English-
speaking West Indian territories, Jamaica achieved her independence in 1962. In the general elections of that year, the Jamaica Labour Party, led by Sir Alexander Bustamante, defeated the People’s National Party. On his election the Prime Minister announced that he would introduce early legislation to control rape and ganja. True to his word, he spearheaded a bill proposing severe minimum penalties for rape and related offenses, which was rushed through with virtually no debate. The Opposition walked out of the chamber, complaining of insufficient time to study the bill.

Over the next two years a series of legislative debates were held about proposed new ganja legislation. At least on the surface, the debates were marked by a more careful presentation of supporting and opposing positions than in the past. Nevertheless, as in the past, practically no evidence, other than anecdotal, was presented, even though the new Government claimed that the proposed legislation was a result of the findings of a committee of experts formed in 1963. This was the first that had been heard of this investigative body; its members were not named nor were its findings published.

Party acrimony remained strong when the ganja amendment came up for debate. Conditions conspired to turn it into a political football rather than a serious attempt by either side to examine all the implications of a major legislative change. Unlike earlier debates on the same issue, the new bill was presented by the Minister of Health, rather than the Minister of Home Affairs. In a sober opening statement, Dr. H.W. Eldemire, explained that the bill was directed against a newly established offense, that of allowing premises to be used for cultivation or use of ganja; that the police would be empowered to seize vehicles suspected to have been used for carrying ganja; and that penalties would be increased:

This is not a problem which faces Jamaica alone; it is a problem that nearly all the world is concerned about...

Eight per cent of the admission to the Bellevue Hospital [Kingston, Jamaica] in the male section have been attributed directly to ganja intoxication...

It is accepted by all the authorities that I have been able to read that the danger in ganja is in its immediate effects, which induce violent psychosis and violent reaction; and these are its immediate effects.
We are not talking about long-term effects; the long-term effects create in a person indolence and laziness; and you can well see the social repercussions of this.

A young person suffering from its hallucinatory effect develops a definite chronic state; and this is one of the dangers of ganja. They definitely get a panic state because of the hallucination; and after smoking the drug or drinking the tea, known sometimes as "wisdom weed," they get a phase of hypersensitivity and psychomotor activity which responds to external stimuli in a very exaggerated manner when the drug is specifically taken to release repressed feeling.

Norman Manley, for the Opposition, replied that:

The country has a right to be told what is the extreme danger involved in this thing that warrants so severe a penalty... the Minister, having devoted quite obviously the utmost attention to the matter, has been unable to advance anything like a real valid scientific opinion for saying that the danger of this drug is so extreme, that the peril to society is so great, that it deserves a minimum penalty of five years for the smallest offence and a mandatory penalty of 18 months for merely smoking ganja or being in possession of it.

Manley pointed out that ganja was grown in backyards all over the country and used as medicine and that the Government had not established that it was even as harmful as cigarettes. He noted that no data had been presented relating to Jamaica; "The Minister has been careful not to say that there is any evidence of a connection between violent crimes and the use of the drug"; and that the prohibition law (Volstead Act) in the United States had had very damaging side-effects. He also referred to the views of the senior Government psychiatrist, Dr. V. Williams, who had given evidence for the prosecution in a well-known murder trial. Williams had denied that ganja could support a defense of diminished responsibility and said that, on the contrary, it might lessen a man's intent to commit a crime, although it might make him "over-confident." Manley suggested that many substances known to give "over-confidence" could be purchased in drug stores and that, in introducing the severe penalties, Government was going against the recent evidence of its senior expert. Since the effects of ganja were
still in doubt, he proposed the appointment of a Commission of Enquiry to study them. As his speech progressed, Manley became stronger in his criticisms:

The moment you are dealing with offences which are not crucial to the life of the society, by telling the Court that the youngest offender, the smallest offender, must get a harsh, brutal, life-ruining penalty in the same way as the hardened and wicked offender, you are unfit to be legislators and unfit to be in charge of human beings, human lives in a civilised country .... It is all very well enough to have this sort of law in fascist countries.

This ignited the debate. The Minister of Housing, Clem Tavares, rose to respond to Manley’s speech:

He [Manley] almost formed the opinion as if he thought that ganja is a wonderful thing and that people should use it.

Tavares’ remarks transformed the debate into a party confrontation, and the Minister of Education, Edwin Allen, charged that although Manley did not support the use of ganja, his “hair-splitting and technicalities” would mislead the public and detract from the essential message that ganja was highly dangerous:

What are we to expect when illiterate parents understand – for they cannot read it in the newspapers, they can hear it on the radio – when they hear that the leader of the Opposition stood up in the Honourable Parliament and made a speech against the penalties for smoking ganja and trafficking and dealing in ganja?

Although the Government specifically tried to exclude consideration of the effects of ganja, the early part of the debate included discourses by two members of the legislature who were medical doctors attached to the University of the West Indies: Senator Kenneth McNeill on behalf of the PNP and Senator Ronald Irvine on behalf of the JLP. Their addresses illustrated the great difficulty in assessing the effects of ganja from reviews of scientific literature and the ease with which selective summaries can support completely contradictory positions. McNeill repeated the argument that no Jamaican data had been introduced by the Government:
There is not the slightest evidence in the literature to suggest that there is an association of ganja smoking with criminology. On the contrary, the incidence of ganja smoking has increased at a rate far more rapidly than the incidence of crime; and the evidence of any particular crime of violence being associated with ganja has been nebulous and, to my mind, never been before the Courts of this country or any forensic psychologist.

Senator Irvine, on behalf of the Government's position, itemized the dangers of ganja to Jamaica:

Reports on the drug have come from the Far East, from Africa and the U.S.A. And these reports are conflicting. What every authority has stated, however, is that the reaction to the drug after an intoxicating dose depends on the basic personality of the person who takes the drug. If he is passive, he may become more passive; if he is violent, he may become more violent. Therefore, when we are trying to interpret whether this drug is an evil thing or not we have got to interpret it in terms of the type of society in which we live. We all know the nature of the people in the Far East tends to be more passive in outlook than we are. But the people to whom we are accustomed— who are apt to use this drug, tend to be more aggressive, to express themselves more violently; and among persons of such personality when this drug is taken it can cause pretty violent effects.

The thrust of the amendment resulting from this debate was to increase the mandatory imprisonment for the first conviction of possession; to give wider powers of search to the police, to make an offense to allow premises to be used for cultivation or use of ganja and to empower the police to seize vehicles suspected of carrying ganja. After its passage, no further amendments were made to the Dangerous Drugs Law from 1964 to 1972.

Throughout its entire history, ganja legislation has been deeply rooted in local, anti-lower-class sentiments; and allegedly damaging effects of ganja, particularly its supposed relationship to violence, were never seriously disputed. With few exceptions, participants on both sides tended to accept "the spirit of the legislation," the need for firm controls. Functionally and structurally, the ganja proscriptions are reminiscent of the laws against seditious libel,
unlawful drilling and obeah. Time after time, the widely held concept of ganja driving ordinary men (i.e., working men) berserk, either in individual or mass incidents, arose in the ganja debates.

The nature and extent of the acceptance of ganja into the lifestyle of the average Jamaican was never seriously examined or debated, and the possibility that severe legislation might conflict sharply with folk values was not viewed as a serious problem. At various points, it was categorically asserted that restrictive legislation could change widespread values and behavior. At other times, it was asserted that ganja smoking was the practice of a dangerous minority that could only be controlled by severe legislation.

Jamaican ganja control has failed in its objective to eliminate or reduce the cultivation and use of ganja. Over six decades, all types of control mechanisms have been employed with the exception of massive public propaganda or severe penalties for export. Stringent penalties for all other types of ganja offenses, considerable extensions of police power, rewards to informants and to successful police prosecutors, large-scale police raids and, since 1963, use of helicopter searches and surveillance have all been used to uphold the Dangerous Drugs Law. Nevertheless, the evidence strongly suggests that ganja use and cultivation have increased and, significantly, that these law enforcement methods may well have had damaging side-effects on the administration of justice generally. At no stage was any attempt made to collect systematic information about ganja use or to institute any national studies about its effects.

On March 28, 1972, a copy of the final report of the research project on which this book is based was presented to Dr. Kenneth McNeill, who was then the Minister of Health and Environmental Control in the newly elected PNP Government, of which Michael Manley was Prime Minister. During May 1972, announcements about a series of articles on the effects of ganja and ganja use began to appear in The Daily Gleaner, Jamaica’s leading newspaper. Publication of the series – which was the full text of the research report – commenced on June 3 and continued in 50 daily installments. After the series began to appear, Dr. McNeill acknowledged that he had made the document available to the press. In a letter to a senior member of the research project, he wrote:

I take full responsibility for this. It was my view that this report
was one of major concern to all the people in Jamaica and it was my wish that they should have access to it, to come to their own conclusions about what are to many, quite revolutionary revelations. The report was freely handed to me without reservations, and in the knowledge that I am a political representative of the people, I must first consider the interest of the people.

The series attracted considerable comment, both favorable and antagonistic, from the public, columnists and editorialists. Of more immediate importance, however, it appears to have been used to influence the course of new legislation in the House of Representatives. Specifically, the PNP Government, in one of its first major legislative efforts, proposed an act to abolish mandatory sentences for several categories of crime. These included rape, carnal knowledge, robbery with violence, burglary, housebreaking, and cultivating, selling or possession of ganja. For the PNP this was a major policy position, implementing its long-held opposition to mandatory sentencing. The debate, in August 1972, demonstrated little difference in the points of view of the two parties. Government speakers, citing police statistics, argued for the new legislation on the grounds that mandatory sentences had not reduced crime. The Opposition defended the reasons why they had supported and implemented the mandatory principles during their tenure in office and argued the difficulties of removing the statute for particular crimes. Perhaps the longest and strongest pleas for the amending legislation were made by Dr. McNeill, who suggested that the Government’s position and motives had been misinterpreted by some journalists.

He [McNeill] then referred to an article in the Star of July 22 by Seneca, and he read: “Doubtless there is dancing now among ganja growers and traffickers and the chronic rapist gangs, for they have the most excellent prospects of legislation to facilitate their activities....”

“I say shame!” he [McNeill] said.

He said he had thought it important that the people of Jamaica should know about ganja. He did not subscribe to obscurantism. There were no hidden documents.

Dr. McNeill said that the research on ganja was one of the most epoch-making pieces of research of the 20th century and it could easily alter the legislation in all the countries of the world.
And it was carried out right here in Jamaica, he said, and named the members of the research team.

The frightening thing about Seneca's column, he said, was the dominance of the spectre of colonialism.

He said that much of the present legislation was based on misconceptions.

"At no time am I proposing or is the Government proposing that ganja will be removed from the list of dangerous drugs," he said.

Dr. McNeill referred to a speech by his predecessor in the Ministry of Health in 1964 when the mandatory sentences were imposed and said that it was said then that the immediate effects of ganja were psychosis and violent reaction and that the long term effects were laziness and indolence, that a young person suffered from hallucination.

The report had shown no significant relationship between ganja and crime. Extroversion scores for smokers and non-smokers were identical. They had not used other drugs except Phensic (a local proprietary preparation) or aspirin and there was no evidence that ganja use was a causal factor in other drug use.

This was, however, not the end of the study on ganja, he said. And there were other reports available (condensed from The Daily Gleaner, August 4, 1972).

Although members of the Opposition essentially conceded that the Government had the right to take a different approach to the question of sentencing, they remained unconvinced that mandatory sentences should be abolished. They declined to vote on the legislation. With a large majority, however, the Government proposal was passed on August 11, 1972, and the Governor-General signed it into law. The new act kept the possible maximum penalties for possession and increased the maximum penalties for cultivating, selling and dealing; but it eliminated mandatory sentences and gave the courts discretion over exact punishment.

Four days later, some 200 prisoners serving mandatory sentences were released from Jamaican prisons, pardoned by the Governor-General. The Daily Gleaner reported on August 16, 1972, that "most of those released had been serving mandatory sentences for
breaches of the Dangerous Drugs Law," that is, they were offenders against the ganja codes.

In 1973 and 1974, reports of large-scale, organized exportation of ganja aroused public concern and the attention of the government. According to the authorities, the smuggling of Jamaican ganja across national boundaries in exchange for money and apparently for small arms has become a thriving enterprise, compounded by a further ominous note that Jamaica has become a trans-shipment port for hard drugs from South America to North America. The Prime Minister, Michael Manley, reported to the House of Representatives that "the people behind the racket were not from the ghettos of Jamaica, but from the best residential areas," stating that these people are "in cahoots with massively organized crime in our neighboring continent of North America" (Trinidad Express, May 31, 1974).

To combat this development, which is allegedly linked to a wave of criminal activity that has included the murders of several prominent Jamaicans, a number of drastic legislative measures have been enacted or proposed. Among these are proposed amendments to the Dangerous Drugs Law introduced in April 1974 that call for massive penalties for trafficking in ganja and hard drugs. This bill provides for life imprisonment for trafficking in opium and cocaine and considerably harsher penalties than those now existing for ganja. As of this writing the bill has yet to be ratified.
Chapter IV

The ganja complex

Cannabis has gained major social, political and economic significance in Jamaica despite sixty years of stringent legislation against its cultivation, distribution and consumption. The nature of ganja-related behavior and beliefs in Jamaica lends itself readily to institutional description and analysis. S.F. Nadel, noted British anthropologist, has defined institutions as "standardized modes of co-activity" (1951:108) with charters of values, distinctive forms of social groupings and personal relationships, set cycles of activities, material apparatuses and purposive character.

The Jamaican ganja complex, as it presently exists, fits well within Nadel’s definition, exhibiting as it does a series of definable and repetitive activities, characteristic social groups and an integrated body of beliefs and values. While the ganja complex cannot be considered a core institution, essential to the survival of Jamaican society such as, for example, the institutions of kinship, economic life and government, it is a social phenomenon that greatly influences the lives of the working-class community. A consideration of various aspects of this viable and growing institution within the context of the larger Jamaican society is necessary to understand some of the frictions in the relationship and some of the uneasy adjustments that have developed over time.

As noted in Chapter II, the roots of the Jamaican ganja complex can be linked to the Indian subcontinent. During the latter part of the nineteenth century, its prototypical forms were carried to the island by East Indian indentured laborers, recruited to replace the emancipated slaves in the cane fields. Present-day techniques and
types of ganja use, critical parts of the ganja lexicon and much of the justificatory ideology surrounding ganja lend strong support to a claim of a direct India-to-Jamaica diffusion. The great majority of ganja users in contemporary Jamaica, however, are not East Indians, who form only a small minority of the population, but Black laboring people, both rural and urban, who are descendants of the African slaves forcibly brought to the New World in the seventeenth and eighteenth centuries.

Although the exact process is obscure, ganja and its associated uses apparently were relatively easily incorporated and reworked into the cultural inventory of the Black lower class of Jamaican society, despite years of stringent sanctions against its cultivation, distribution and consumption. It has, indeed, thrived and proliferated throughout the country as a complex. At this time, the Indian roots have, for all intents and purposes, been forgotten. In fact, some culturally militant Black users claim Africa as the original source of Jamaican ganja and cite Biblical references to the existence of “the herb” on King Solomon’s tomb.

Putting questions of derivation aside, it is clear from prima facie evidence that ganja use in Jamaica is extraordinarily widespread. Although national statistics on these illegal practices are non-existent, various estimates of the number of users, ranging from one-third to two-thirds of the lower class, have been given by different sources. A somewhat more precise estimation can be made based on the work of the Jamaican project team. For example, a survey of ganja smoking in one of the seven communities studied indicated that fully 50 percent of all males over the age of 15 were smokers (half of these being classified as heavy smokers); 7.3 percent were former smokers; only 20 percent were non-smokers; and 22.3 percent were unclassifiable due either to conflicting information or reluctance by respondents to provide information. If only half of the unclassifiables (11.1 percent) were included in the smoker group, a very conservative procedure, a figure would be generated for adult male smokers of over 60 percent. If the 7.3 percent former smokers were added then over 68 percent of the adult males in the community were currently smoking or had smoked ganja in the past. After comparing these data with those derived from the other study localities, it can be safely stated that the estimated figures given, from one-third to two-thirds of the lower class, do not misrepresent the extent of male
smoking in the rural areas. In fact, they tend to lend credence to the higher ranges of these more impressionistic estimates.

Male ganja smokers make up only part of the ganja using population, however, since women, in lesser numbers, also smoke. A larger pool of individuals including children, adult smokers and adamant non-smokers drink ganja teas and tonics for medicinal or prophylactic purposes. Many use the plant as an external tonic, and some make occasional use of ganja in food. Given the extent of non-smoking uses, one could estimate with considerable confidence that some 60 to 70 percent of the lower section of the rural population, men, women, and children, inhale, ingest or use ganja in some form – undoubtedly one of the highest rates of marihuana use for any population in the Western world.

An overview

The exemplificatory data used to describe the institutional characteristics of the ganja complex are drawn primarily from one of the seven communities studied by the project anthropological team. This community, in its social organization, economic base, population composition and size – indeed, in all its critical social and cultural dimensions – essentially typifies the rural, interior settlements that contain from a third to a half of the total population of Jamaica. The material which follows has been selected not for its specific intrinsic interest but for its general representativeness of rural life.

In Jamaica, hill villages are communities of farmers. Almost all householders own or have access to some cultivable land, due largely to regional land authority loans that have made possible the purchase of five-acre plots for some small farmers. But much of this land is poor, often steeply sloped, eroding and subject to capricious drought and deluge. On this land they grow, either for subsistence or profit, a variety of tree and ground crops – mango, avocado, pear, lime, pimento, carrot, yam, sweet potato, gunja pea and several kinds of bean. Bananas were once an important cash crop, but small farmers can no longer compete with the large estates.

Few householders can count on the yield from their land even for subsistence, though something less than a quarter of the households, those among the poorest, have no other means of making a living.
Most villagers eke out their incomes from agriculture, with occasional work as masons or carpenters or as manual laborers for the Public Works Department. Some do day-to-day jobs for other small farmers. In many parts of rural Jamaica, the lower-class male seeks to have as many sources of income as possible, no matter how small, for protection in his basically inadequate economic environment. But this is not easily done. Opportunities to be even part-time tradesmen or self-employed artisans in such communities are effectively restricted to the older, long-established householders. Consequently, the young are encouraged to look to Kingston and abroad for employment. But this is not easy, since some degree of education beyond primary school is often required in the urban job market, and the typical — that is, poor — boy or girl from the rural area does not complete elementary school. The exceptions are considered fortunate.

Only a few, relatively affluent parents can afford to send their children to secondary schools in Kingston. Parents, who wish their children to be taught a trade but cannot afford the cost of vocational training, have only Government youth camps and trade schools available, and these are difficult to enter without political influence.

From the time they stop attending school until they settle down to the norm of adult routine, the young generally continue to live in their parents' "yard." For the few who get work, usually tedious day labor for better-off farmers, the pay is poor — no more than J$1.00 per day (US$0.96 to US$1.20). Efficiency is low and discontent is high. Local employers complain that "these rude boys don't want to work, only walk up and down and smoke ganja," though, at the same time, their own sons reject farming and leave the community for more prestigious middle-class employment in the capital.

There are sharply distinct differences in social position between the families of the "rude boys" at the bottom and those who are better off and best off. The Jamaican social anthropologist, M. G. Smith, reports in his study of rural community organization that:

Locals would rank their neighbors in as many as six strata, distinguishing them partly in terms of behavior, partly in terms of wealth. People not placed in adjacent strata rarely visit one another, while members of widely separated strata would not call at one another's homes even ... at the time of
serious illness or death.... The main segments reflect the principal economic and social forces operating within the community. The shopkeepers and produce dealers control credit and certain marketing facilities.... The teachers and civil servants control another set of facilities.... Employment opportunities for unskilled labor are controlled by government foremen and road headmen on the one hand and by the overseers or owners of nearby properties or estates on the other. The more important power structures operating within a community are controlled by or through local people, who are either native to or so long resident in the community as to be identified with it. For this reason, the formal associations within which leadership is exercised mainly by salaried migrants have less direct significance for the community structure than would appear on the surface. Influence and power rest with those who control economic resources and employment opportunities ... (Smith 1965: 189–191).

At the apex of the economic structure of this representative community, sharing social position with no one, is a retired national politician who owns large tracts of land and much livestock. As a landlord and giver of jobs, as justice of the peace, as an official of the agrarian bank, he is said to run the community as if it were his private plantation, suppressing economic improvement and thereby ensuring for himself a steady source of cheap labor.

Many degrees below him, the next social level consists of 20 families. They live in roomy cement houses close to the main road, own cars or motorcycles, are legally married, send their children to school in Kingston and belong to the Anglican (Episcopal) or Methodist churches. A few have profitable farms, but most of them do no manual work. They are the ministers of God, the head teacher, the Government social worker, the postmistress, the public works contractor and the like.

The next lower level consists of 53 families, who are slightly better off than the truly poor and are straining for something better. These people are still culturally indistinct from the mass of the population, but they manage at least to make ends meet, working their land and taking jobs where they can, sometimes in Kingston.

At the lowest level are 79 households (52 percent) whose members
live from hand to mouth, with little likelihood of doing much better. They have insufficient land, insufficient education and no marketable skills. These are people whose livelihood depends, in part, on the cultivation of *ganja*.

*Patterns of ganja activities*

Patterned activities, an indispensable element in the definition of institution, are clearly evidenced in the *ganja* complex. Analytically, these can be separated into three distinct categories: cultivation, distribution and consumption.

*Cultivation*: Jamaica does not import *ganja*. In fact, in recent years, it has developed an illegal export trade to North America and the United Kingdom. In most regions of the island, two crops a year can be harvested, the growing cycles generally running from April to August and from June to November. Conditions for growing *ganja* in rural Jamaica are good, partly because there are large areas of bush well removed from human traffic. In the illustrative community, at least 39 households of 153 are openly known to be cultivators; but, given the secrecy attached to illegal practice, it may be assumed that there are many more. Twenty-two of the identified households grow *ganja* for personal use only, while 17 also grow it for sale. All but five of the 39 belong to the lowest social segment of the community. Although the five exceptions cultivate for sale in the urban areas, on a comparatively large scale, they have been able to keep their *ganja* activities fairly well hidden from the community.

Despite relatively ideal cultivation conditions, this community is not a particularly large producer of *ganja*. The largest commercial *ganja* planter cultivates about 200 roots. The next four in size plant 100 roots on the average, and the rest of the commercial cultivators may put in from 30 to 100 roots. Almost always they scatter their roots in bush land, rarely risking more than 10 or 15 in any one place. The biggest producers estimate that a mature plant yields from one to as many as three pounds of marketable *ganja* (worth J$20.00 to J$60.00 at the time of the study). The lesser cultivators, who grow for their own use, generally plant no more than 10 roots in a season. None of the *ganja* cultivators relies exclusively on this production for a livelihood. For the great majority, it is an insepar-
able ingredient of the ganja complex style of life, as well as a source of additional income. All in all, the cultivation of ganja is a poor man’s enterprise.

Natural and social circumstances tend to make ganja growing attractive to the poor farmer. With steep, tiny fields unsuitable for mechanized cultivation, he works with only a few hand tools, including the machete and the hoe. Subpar soils, uncertain weather, unstable market prices and inadequate economic reserves make crop specialization far too great a risk, so mixed cropping, including ganja, partly for household consumption and partly for the cash market, is the rule. To protect himself from prosecution, he plants his ganja in isolated plots of land poorly suited for other use, for ganja grows easily, “like a weed.” The only really demanding period of the growth cycle is the first three weeks after planting, when the seedlings must be watered daily and guarded from insect pests. All that is required after that is occasional budding until the plant reaches maturity.

Even though, as in most of Jamaica, in this community it is possible to have two crops a year, most cultivators plant only once, in June, because the April-August cycle is subject to insufficient rainfall. After ganja is reaped, it is left in the fields to cure

1 and is brought out in small quantities as needed.

Unlike the food crops market, that for ganja is remarkably stable, with regional prices of the several grades rarely fluctuating. Consequently, its cultivation can provide a small but steady source of income for poor households. Ordinary small farmers in this community as well as in the others studied claim they would not

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1. Following are the various grades of cannabis:

Kali: the fully matured plant, recognized by presence of seeds and by strong scent; considered the most potent form of ganja, it is the most expensive.

Bush (also bushweed): the immature ganja plant, pale green in color; distinguished from kali by the absence of seeds; considered less potent than kali and not as smooth for smoking.

Seeded bush: the stage immediately prior to full maturity; better for smoking than pure bush but not as potent as kali.

Green ganja: the cannabis plant when first cut and before curing; can be either of the kali or bushweed variety; greatest use in medical potions or teas.

Cured ganja: cannabis which has been set to dry by sunlight; can be either kali or bush: a full three-month curing process is generally not adhered to for bush; curing is to increase ganja potency, so cured kali is generally regarded as much stronger than green kali.
bother with *ganja* cultivation if their land holdings were large enough, level and easily irrigated, even if *ganja* were not illegal, but they continue to grow it because they have no viable economic alternative.

Only the five commercial cultivators appear to have taken full advantage of *ganja* to improve their socioeconomic status. To do this, they have to operate differently from the small *ganja* producers. They remove the bulk of their *ganja* harvest quickly to sell in Kingston, as it is more prudent to receive a somewhat lower bulk price there than to risk local exposure of their activity or the ever-present danger of theft from their plots. They cautiously restrict their local social activities and relationships and provide no *ganja* for friends. Four do not smoke at all in public and have thus not acquired reputations as “*ganja* men.” One of them is a policeman, a district constable. The three others, who once had close relationships with *ganja*-using friends and neighbors but have given them up, are harshly criticized for being “cross,” “proud” or “dark.” The fifth often smokes with others, but non-smokers tend to be tolerant of this behavior because he has a highly respected wife, an industrious and popular woman, active in community affairs, who has managed to keep their children well disciplined and in school. She insists that her husband sell his *ganja* in Kingston, not in the community, to protect their children from a bad reputation.

The secretive, individual cultivation of *ganja* runs counter to traditional behavior among Jamaican small farmers, who often work in reciprocal partnerships; but by cultivating *ganja* independently they avoid the fault-finding and the wrangling that could ensue if a jointly worked field were raided by the police, plundered by others or neglected by one of the partners. Each grower does all the work and takes all the profit at the same time safeguarding his reciprocal work relationships in the cultivation of legal crops. The only exception to this pattern in the community is the largest planter, who employs several adolescent boys to weed his *ganja* fields and pays them, not in cash but with *ganja*.

The small farmer’s policy of noncooperation in *ganja* cultivation leaves him at constant risk of theft from his not easily guarded land. Theft of other crops (praedial larcency) ranks second only to domestic squabbles among complaints lodged at the police station; but the victimized *ganja* grower, even if he knows the thief, has no
recourse to the law to protect his illegal cultivation. The following account (altered only by the use of pseudonyms, as is the case with the material throughout this volume) is an illustration of one way of dealing with a thief:

Anderson, a ganja cultivator, discovered that Bailey, another ganja cultivator, had been stealing his "herbs." Recognizing the futility of directly confronting Bailey, he went to people closely associated with Bailey and told them that he knew Bailey was stealing his ganja, that he planned to put poisonous seeds that looked like ganja seeds into a few of his plants and that this poison would bring instant death to the consumer. All this was imparted with an air of great secrecy and with the plea that his plan not be told to Bailey. Predictably, Mr. Bailey's friends warned him of the "plot" and the depredation of Mr. Anderson's ganja fields ceased.

Alternatively, the victim of pillage might go to Pastor Marston, leader of the Pentecostal Church, who is also the local "science man," a practitioner of a form of benign magic. In his dual capacity, the pastor keeps well informed about local events and has an intimate knowledge of relationships among villagers. The information he possesses and his position give him sufficient power to manipulate situations for the advantage of clients, as in the following case, names again disguised:

Mr. Crump discovered that a large quantity of ganja that he had left for curing was stolen. After making discreet inquiries, he determined who the thief was. Unable to go to the police, he turned to Pastor Marston with his problem. Pastor Marston, while not promising that he could guarantee the return of the stolen ganja, instructed Mr. Crump about steps that should be taken to punish the thief. Following instructions, Mr. Crump posted a parchment notice on an avocado pear tree near the place where the ganja had been stolen. On the parchment, inscribed with dove's blood, was a Biblical psalm decorated with magical symbols. A few days after the posting, the wife of the thief came to Mr. Crump with the half-cured ganja, begged for forgiveness, and asked him to remove the curse. Mr. Crump, gratified with the results, assumed that the thief
had seen the parchment and recognized its significance. In reality, the wife of the thief was a member of Pastor Marston’s congregation; he had called her in, lectured her strongly on the evils of theft, and told her to return the *ganja* before serious misfortune could befall her and her husband.

The local police do not disrupt *ganja* cultivation to any appreciable extent unless ordered to do so by parish headquarters after the filing of a complaint. Then a *ganja* field may be raided and there may be an arrest, sometimes bringing Pastor Marston’s services into play. The arrested man usually cannot afford the services of legal counsel, but he may appeal to the Pastor to obtain his release, for the Pastor has police and civil servants among his clientele on whom he can call for special favors. Failing this, Pastor Marston has financial resources to apply to the case, if he chooses; though at the same time he publicly deplores the thievery and the conflict, saying that action by the police is far less worrisome than the jealousy and hostility that provoke men to take advantage of one another. Pastor Marston does not smoke *ganja* but admits to drinking tea — in privacy — every night, from supplies that he gets outside the community.

Two of the few East Indians in the community say that they watch with amusement while the “poor Afro-Jamaicans” fight among themselves, report each other to the police and steal from each other’s *ganja* plots. In their opinion, the Jamaican black man is so improvident that he will use up all his *ganja* before it matures, before “it comes to kali.” In contrast, one of them described his family’s *ganja* enterprise in another parish, in which related males work together, cultivate several acres, rotate guards and have an elaborate, if not wholly effective, warning system against police raids. His brother-in-law, a leader in the enterprise, was then serving his third year in prison and had one more to go. Nevertheless, his wife was carrying on the business as usual, so that on his release he would find himself a rich man.

*Distribution:* The distribution of *ganja* can best be characterized as a small, albeit illegal, business activity engaged in by relatively large numbers of occasional and part-time vendors. Given the patterns of occupational multiplicity found in rural Jamaica, *ganja* selling can
be viewed as another supplementary economic enterprise available to the poor. In the illustrative community, sixteen men out of the total 178, or nearly 9 percent, sell ganja in some quantity to others in the community. This figure does not include the five “commercial” producers who grow locally and sell in Kingston. Of these sixteen vendors, twelve are also ganja growers. Eight of this latter group sell ganja in small quantities to friends and acquaintances until their stock is depleted, when they become buyers for their own use; the remaining four cultivators also sell their crop during the season but buy additional stock in the capital as the need arises. Four vendors are not cultivators and buy their entire ganja supply in Kingston. None of the sixteen vendors are full-time specialists; all combine selling with agricultural or other work, even though dealing in ganja may, for some, bring in a major portion of their income.

The life style of these ganja vendors is similar to that of the majority of the population. Almost all belong to the next-to-the-lowest socioeconomic group and rely on their land for their basic livelihood. Almost all have children and stable households. Most are not regular church-goers, nor are they active in community organizations; but neither are they known frequenters of rum shops. Except for their ganja activities, they are law-abiding, quiet and conservative. The two exceptions to this pattern among the vendors are the wayward son of a middle-class family and a “bad boy” who has two brothers in prison for larceny and assault. For the greatest part, then, vendors are “nice guys,” jocular, inoffensive, not given to quarrels or displays of anger.

All the vendors trade exclusively with individuals in the two lowest socioeconomic strata, and almost invariably in small quantities,² sticks (J$ .20) or half-sticks (J$ .10). The price is constant,

2. Quantities, weights and costs of ganja:

Stick, bump, head: interchangeable terms for the amount of ganja needed to make at least one cigarette or cigar; the use of the terms varies in different localities; the weight varies from 2 to 6 grams, including the brown paper wrapping, which weighs approximately 1/2 gram; cost varies from 10 to 20 cents Jamaican (12 to 24 cents U.S.).

One quarter: so-called because it ought to be a quarter-ounce (1 oz. = 31.104 grams) but is not; the next most commonly purchased weight, the quarter, is a pipeload, weighing from 10 to 20 grams; cost varies from 38 to 70 cents Jamaican (46 to 84 cents U.S.).

Half-ounce (so-called): quantity sometimes purchased for pipe-smoking or to be
even though the vendors may have to pay more when ganja is in short supply. They sell directly only to the few whom they can trust, but indirectly they supply a large number. Most young users get their ganja directly from particular vendors. Boys do not, as a rule, purchase ganja from adult vendors in the village for fear of exposure. They generally deal with friends who have a supply, but there are two young vendors, both of whom once lived in Kingston, who cater exclusively to the youth. One buys all his ganja in Kingston; the other cultivates his own in the village surrounds. One of them occasionally offers a free supply and invites boys to share a chillum.\(^3\)

In this way he has gained control of almost all the smoking sessions of the young, dominating discussions and passing on acceptance of new members.

**Consumption:** Ganja is used by rural Jamaicans in a variety of ways. It is smoked, brewed as medicinal tea and tonic, cooked in food, and applied externally as a poultice or liniment.

**Inhalation:** Among Jamaicans, the spliff is by far more popular than the chillum. It is more convenient and safer, for the small quantities of ganja necessary for spliffs can be concealed in the user’s clothing to be readily handy during work breaks in the field. Each user rolls and smokes his own, seldom sharing. He inhales deeply, holds the smoke as long as possible and exhales slowly. The chillum is used much less frequently because it is usually shared, and often there are no established places of congregation for ganja smoking. Table 1 indicates the prevalence of ganja smoking in the illustrative community by socioeconomic level and degree of use.

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\(^3\) Chillum, from the Hindi word Chilm, is properly the pipe bowl, but the term is often used to refer to the whole pipe, which is a Jamaican equivalent of the “hookah,” or Middle Eastern water pipe. It is made of wood, coconut shell or horn, or a combination of these materials, and is fitted with a stem of wood or rubber tubing. Chillum smokers usually gather to share the pipe.
Table 1. Prevalence of ganja smoking status among all males over 15 years of age in illustrative community, by socioeconomic level

<table>
<thead>
<tr>
<th></th>
<th>Heavy smoker</th>
<th>Occasional smoker</th>
<th>Chance smoker</th>
<th>Former smoker</th>
<th>Non-smoker</th>
<th>Other</th>
<th>Status unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top level (No. = 1)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>100%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle level (No. = 19)</td>
<td>5.3%</td>
<td>21.1%</td>
<td>5.3%</td>
<td>52.6%</td>
<td>10.5%</td>
<td>5.3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(4)</td>
<td>(1)</td>
<td>(10)</td>
<td>(2)</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Low level (No. = 59)</td>
<td>1.7%</td>
<td>3.4%</td>
<td>33.9%</td>
<td>6.8%</td>
<td>23.7%</td>
<td>6.8%</td>
<td>23.7%</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(20)</td>
<td>(4)</td>
<td>(14)</td>
<td>(4)</td>
<td>(14)</td>
</tr>
<tr>
<td>Lowest level (No. = 99)</td>
<td>42.4%</td>
<td>10.1%</td>
<td>9.1%</td>
<td>8.1%</td>
<td>11.1%</td>
<td>2.0%</td>
<td>17.2%</td>
</tr>
<tr>
<td></td>
<td>(42)</td>
<td>(10)</td>
<td>(9)</td>
<td>(8)</td>
<td>(11)</td>
<td>(2)</td>
<td>(17)</td>
</tr>
</tbody>
</table>

Total, 178 men

Heavy smokers: smoke every day (four or more spliffs a day), if ganja is available, and in all settings (own yard, at yards of friends, at work, during periods of leisure); hold reputations as “ganja men” or “bushmen”.

Occasional smokers: generally smoke ganja three or four times each week, usually in the company of friends in a social or recreational setting.

Chance smokers: individuals who take a draw when offered; may well be regular consumers of ganja tea and are not opposed to smoking or being with heavy users while the latter are smoking.

Former smokers: non-smokers who smoked ganja in the past; generally older men who express no adverse sentiments about ganja use.

Non-smokers: individuals who never smoke ganja: rarely seen in the company of “ganja men.”

Others: individuals difficult to classify; includes the occasional village “mad man” with a sporadic ganja-use pattern; very recent “Christian” converts who claim to have just given up ganja and some villagers who adamantly assert they do not use ganja, though there is circumstantial evidence that they do.

Status unknown: no information as to ganja use available.

Medicinal teas: Teas made from ganja leaves or sticks are widely believed to have prophylactic and therapeutic properties. Of all methods of consumption, tea is the most prevalent in rural communities and is particularly recommended for children from infancy, though opinion differs about how much, at what time and how often it should be given to them. There is the conviction that it “brainifies” them and keeps them healthy. Although the use of ganja tea cuts across social lines, used in households whether smoking is common
<table>
<thead>
<tr>
<th>Informant</th>
<th>Amount</th>
<th>Preparation</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>15, M, school</td>
<td>1 cup every morning and night.</td>
<td>Boil (leaves or sticks), add 2 tsp. sugar.</td>
<td>“Makes you strong and smart.”</td>
</tr>
<tr>
<td>16, F, school</td>
<td>1 cup every morning</td>
<td></td>
<td>“If belly hurts in morning, it’s all right by noon.”</td>
</tr>
<tr>
<td>16, F</td>
<td>1 cup every two weeks.</td>
<td></td>
<td>To prevent constipation.</td>
</tr>
<tr>
<td>17, M</td>
<td>1 cup every day.</td>
<td>Boil.</td>
<td>“Makes you powerful in sex and in cricket.”</td>
</tr>
<tr>
<td>18, F, mother</td>
<td>1 cup every other day.</td>
<td></td>
<td>Boil tea for whole family. “Makes children strong and smart.”</td>
</tr>
<tr>
<td>20, M</td>
<td>1 cup every night.</td>
<td>Draw (steep in hot water); add milk and sugar.</td>
<td>Green or dried ganja.</td>
</tr>
<tr>
<td>21, F, housewife</td>
<td>1 cup 2 or 3 times per week.</td>
<td>Draw.</td>
<td>To prevent illness; prefers cured ganja because stronger.</td>
</tr>
<tr>
<td>24, F, housewife</td>
<td>Whenever available.</td>
<td></td>
<td>Her boyfriend uses tea to build blood for farm work abroad.</td>
</tr>
<tr>
<td>26, F, housewife</td>
<td>1 cup 2 times per week.</td>
<td>Draw.</td>
<td>For children and to “keep fit.”</td>
</tr>
<tr>
<td>30, F, housewife</td>
<td>As necessary.</td>
<td></td>
<td>When ill.</td>
</tr>
<tr>
<td>and mother</td>
<td></td>
<td></td>
<td>For children, to prevent colds.</td>
</tr>
<tr>
<td>36, M, farmer</td>
<td>As necessary.</td>
<td></td>
<td>Always before physical examination for farm work abroad.</td>
</tr>
<tr>
<td>Old man, East Indian</td>
<td>Every day if possible</td>
<td></td>
<td>To keep in good health.</td>
</tr>
</tbody>
</table>

(Abridged from original data.)
### Table 3. Uses of ganja tonics

<table>
<thead>
<tr>
<th>Informant</th>
<th>Type of ganja</th>
<th>Rum and/or wine</th>
<th>Special instructions</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>15, M, school</td>
<td>green</td>
<td>rum</td>
<td>Put aside for 3 months and add water before using.</td>
<td>1 or 2 tsp. twice a day.</td>
</tr>
<tr>
<td>22, M, farmer</td>
<td>green or dried</td>
<td>rum or wine</td>
<td></td>
<td>1 tsp. every morning,</td>
</tr>
<tr>
<td>23, M, East Indian</td>
<td>green</td>
<td>rum</td>
<td>Set aside for 15 days.</td>
<td>before breakfast.</td>
</tr>
<tr>
<td>26, F, housewife and mother</td>
<td>rum</td>
<td></td>
<td>Pour some into a glass of ice water for “bellyache” or drowsiness.</td>
<td></td>
</tr>
<tr>
<td>26, M, farmer</td>
<td>rum</td>
<td></td>
<td>Put a few drops in children’s feedings when they are noisy.</td>
<td>As necessary for sickness or “when you take cold.”</td>
</tr>
<tr>
<td>26, F, housewife and mother</td>
<td>green or dried</td>
<td>rum or wine</td>
<td>Wait 2 days until it’s clear.</td>
<td>Take 2 or 3 times per week.</td>
</tr>
<tr>
<td>50, M, heavy ganja user</td>
<td>green</td>
<td>rum and wine</td>
<td>Take a small wine glass every morning and night before meals.</td>
<td></td>
</tr>
<tr>
<td>50, F, “Nana”</td>
<td>green</td>
<td>rum</td>
<td>Wait 1 month before using.</td>
<td>Half tsp. before bed or as necessary when sick or “harrried.”</td>
</tr>
</tbody>
</table>

(Abridged from original data.)

or not, there is a hesitancy to admit that ganja is given to young children. Table 2 gives illustrative data collected from residents about amounts, frequency of use, preparation and claimed effects of ganja tea drinking.

**Tonics:** Ganja health tonics are most commonly blended from rum, or wine and rum, bottled and allowed to set. See Table 3 for various types of tonics prepared and their methods and purpose of administration.

**Chewing and food preparations:** Only occasional references are made in the community to the use of ganja in food. A Rastafarian reports
that he often chews green ganja stalks or leaves. An adult male prepares "pepperpot soup" with susumba, calalu and green ganja. Two other males add ganja to soup when they cook for themselves in the field. Others say they have heard that ganja can be cooked with greens or chocho and bananas. One young woman makes ganja wine, boiling the plant and leaving it to ferment.

Topical preparations: Ganja poultices and compresses are used for relief of pain and as dressings for open wounds. Green ganja leaves are applied over the wound or painful area and then wrapped around with a thin cloth soaked in ganja tonic. Another treatment for open wounds is to wash the affected area with clear boiled ganja brew and then sprinkle over it ganja that has been parched and allowed to blacken. Older women recommend that infants be washed with ganja leaves at birth and that ganja-rum tonic be gently applied to the infant's anterior fontanelle to protect the child against colds and other ailments and ensure its healthy growth.

Ganja is used in one form or another in at least 106 households of the community (nearly 70 percent of the total 153). Almost all of these drink ganja tea, although somewhat less than half (48 percent) use it solely as tea or tonic. Fifty-five of these households (52 percent) include one or more ganja smokers.

Social groupings

The spread of ganja in Jamaica has generated distinctive social groupings and alignments in all areas of ganja activity except cultivation. Due to the risks involved, as has been noted, ganja is cultivated individually without the assistance of cooperative work groups or partners as is the case for other crops. In the distribution of ganja, however, patterns of social clustering are clearly discernible. As indicated earlier, Jamaican communities tend to have substantial numbers of vendors. Each vendor, even if only a part-time distributor, has his own network of clients, usually from ten to twenty trusted individuals.

While these networks are relatively contained, with admission predicated on the personal knowledge of the client by the distributor, they are also flexible, with new clients introduced who are often vouched for by older members. However, much ganja buying on the island is indirect – the ultimate consumer requesting a trusted person
to procure ganja from a vendor. This friend, in turn, may ask another, so that ganja often passes through an amorphous network of middlemen who may receive little or no cash profit. In this way, the consumer may well end up having purchased ganja from a nearby neighbor without either knowing. The following account of a purchase is a good example of the manner in which a socially conservative villager may obtain ganja:

Davis is a Christian, 4 a devoutly religious man, who does not smoke ganja but wants some for tea, which he drinks regularly. He grows his own supply, but his stock is depleted. Davis asks Evans, his neighbor of many years and a ganja smoker, whether he has any. Evans does not, but he agrees to get him some. Evans goes to his nephew, Frank, a known ganja man and a person who can be trusted. Frank tells his uncle to meet him at the macca tree by the river in an hour. Frank then goes to see Gordon, a known vendor and cultivator, who sells him the amount requested by Davis. During the transaction, Gordon offers Frank a spliff and both smoke. Frank then returns with the ganja to his uncle, who reimburses him. Evans takes the ganja to Davis, who gives him a small amount of it in gratitude.

Larger-scale distributors may service anywhere from 50 to 100 clients. Their operations, unlike the small vendors, are usually localized in what are commonly referred to as “herb camps” and “herb yards.” Often the major vendor in a community will operate a “herb camp” in the immediate vicinity of his house. In addition to ganja, he may have beer, ale or stout for sale. He provides a recreational atmosphere with dominoes, a record player and occasionally even a television set for his customers. Less important dealers may run “herb yards,” where a user can come only to smoke. No other facilities are provided, and a user must either bring his own ganja or expect to buy only limited quantities from the vendor.

During the course of the research no evidence was uncovered to suggest that there were either local, regional or national centralized criminal organizations controlling cultivation or distribution of ganja. In 1974, however, Jamaican law enforcement sources claimed

4. Christian has a narrow connotation, aside from church membership, meaning a person who is abstemious; specifically, one who abstains from ganja smoking, alcohol and fornication.
that the island has become a trans-shipment point for cocaine and that local *ganja* has begun to attract the interest of organized crime from abroad.

The nature and form of social groups involved with *ganja* consumption are best understood in relation to the typical life cycle in the rural areas. Patterns of association change as individuals move from one significant period of their life to another. For the average rural user, at least four such periods are important.

The first phase is that of infancy or childhood, when the very young are introduced to *ganja* through the drinking of *ganja* teas. Even though these brews are consumed privately, in the familial setting, an aura of secretiveness surrounds this ordinary practice; terms denoting *ganja* are generally not used to identify the tea served, and since its taste is almost always obscured by milk and sugar, the drinker may well be unaware of the basic ingredient. Significantly, tea drinking is the only method of *ganja* use in childhood, and this is the only period in a user’s life in which *ganja* is not primarily a peer activity but is intergenerational, with adults prescribing and providing *ganja* for minors who are in their care.

Adolescence is the second critical phase. While young boys are warned about the evils of smoking *ganja*, such occasional admonitions sometimes modified by cautions not to get caught, appear to have minimal impact particularly in households where fathers or surrogate fathers are regular smokers. While parental example undoubtedly serves as a role model, there is substantial evidence indicating that the initial experience with *ganja* smoking is in the company of friends of similar or slightly older age. In contemporary Jamaica, boys may begin smoking during pubescence, with the more precocious starting as early as ten years of age. During the first years after introduction, smoking is often a sporadic, rather than a systematic and regular, activity. Not until a boy begins to earn his living is it economically feasible for him to smoke habitually. Adolescent smokers interact in relatively large and amorphous peer groups, sometimes dominated by youthful *ganja* vendors. Since boys, as a rule, do not purchase *ganja* from adult vendors in their communities for fear of exposure, they rely on young distributors who are also friends and confidants. Participation in these youthful groups varies in relation to the individual’s degree of commitment to *ganja*. Some young boys are essentially only curious bystanders;
others may smoke an occasional spliff; still others, particularly the oldest, are confirmed and steady ganja smokers. This adolescent phase is generally a period of experimentation.

The third period is that of adulthood. In their twenties, young men begin to establish their own households, choose mates, acquire children and settle into their adult work routines. As their life style changes, so do their ganja-related alignments. For one, regular ganja users may begin to plant their own to save money and decrease dependence on vendors. Groups diminish in size and stabilize in membership as choice of smoking companions is deliberately limited to work mates and trusted neighbors. More significantly, the smoking of ganja is no longer the dominant activity of these small networks, as it is for the younger age groups; rather, smoking becomes a natural part of the daily round, an almost unnoticed standard routine at work parties, meal breaks, evening visits and the like. These more tightly knit groups are more egalitarian than the groups of younger boys and have no discernible hierarchical structure; each man generally supplies his own ganja and smokes his own spliffs, or on occasion, one man may supply all the ganja needed for an evening.

The final period is that of old age. Compared to younger age groups, there is a smaller percentage of regular ganja smokers over the age of sixty and a corresponding breakdown of smoking groups. Explanations for this vary: some claim that the brains of old people become weak and "dem kyaan take ganja"; some old people say that as they become older and closer to death they become more Christian, feel guilty about ganja smoking and give it up. It is possible, however, that there are other contributing factors. For one, the incidence of ganja use was considerably less when these men were in their formative and young adult years so that there should be proportionately fewer confirmed smokers among the older males. Secondly, older males who are ganja smokers tend to lose their customary settings and social incentives for smoking as they lose their smoking companions through illness or death. Finally, there are physical and economic factors: many old men are simply incapable of working their own fields, so that their incomes are markedly reduced and their supply of ganja is limited.
Beliefs and values

The conviction that ganja is beneficial is universally held by the using population in Jamaica and is fundamental to the belief system that shapes and supports the ganja complex. The belief system allows for discrimination concerning the various methods of use. For example, non-smokers tend to draw a sharp distinction between the effects of tea drinking and those of smoking. Teas and tonics, they maintain, are absorbed into the blood stream, strengthen the blood and enable it to ward off disease whereas smoked ganja goes directly from the lungs to the brain where it sometimes may have unpredictable consequences. Beliefs about the different effects of ganja drinking and smoking are reinforced and perpetuated by social class differences. Those who only take ganja as tea are generally members of the higher social levels or are aspiring to higher status, while those who are known to smoke and drink ganja are members of the lowest social level.

A range of beliefs relate to the potential effects of ganja on sleep, appetite, sex, reflection, relaxation and work. Descriptions of these effects are often modified by mention of necessary, prior conditions. For example, if the user is in a mood for sleep, ganja suits him well: “It makes you sleep first, then it makes you work.” “Smoking can make you sleepy but tea gives you energy for cricket and sex.” “It makes you sleep nice if you smoke it before bed.” “If you’re in the mood to go to bed it makes you sleepy.” Similarly, if taken before eating, appetite is enhanced, while at other times, it may suppress appetite.

Individual reactions to ganja, when taken for specified purposes, undoubtedly account for the reported differences in the perceived effects of ganja. As it relates to work capacity, however, ganja consumption does not result in different perceptions. Almost without exception, users maintain that ganja enhances their ability to work, that is, to perform manual labor, and they regularly consume ganja with this objective. In this regard, ganja is believed to take effect in two ways. One is the cumulative benefit that comes with “building” one’s blood and strength with regular dosages. Men who are to leave for farm work abroad drink ganja tea or tonic for a few months prior to departure. The other is that ganja has the immediate effect of producing a burst of energy sufficient for completing laborious
tasks. If there is a large field to clear, a farmer smokes a spliff and within minutes, it is claimed, he can easily do the work. Almost unanimously, informants categorically stated that *ganja*, particularly in spliff form, enabled them to work harder, faster and longer. For energy, *ganja* is taken in the morning, during breaks in the work routine or immediately before particularly onerous work.

The belief that *ganja* acts as a work stimulant and the behavior that this induces casts considerable doubt on the universality of what has been described in the literature as “the amotivational syndrome,” or a “loss of desire to work, to compete, to face challenges. Interests and major concerns of the individual become centered around marihuana and drug use becomes compulsive” (D.E. Smith 1968). In Jamaica, and one would suspect in other cannabis-using, agricultural countries, *ganja* is central to a “motivational syndrome,” at least on the ideational level. *Ganja*, in the cultural setting of rural Jamaica, rather than hindering, permits its users to face, start and carry through the most difficult and distasteful manual labor. This belief is examined in depth in the following chapter.

There are also beliefs associated with the mood-conditioning effects of *ganja*. Most respondents associated the use of *ganja* with clear thinking, meditation and concentration, euphoria, feelings of well-being, good feeling toward others and self-assertiveness. With few exceptions, boys in late adolescence and young men in their early twenties reported that *ganja* smoking enables them to reflect on their past and future and gives them insights into the problems of life. The following comments are typical: “This is a time for discussing God, creation, the ruling of man, and signs of the time, such as war and depression.” “It helps you think about the future.” “You plan your life.” “If you have something to consider, you smoke *ganja* to help you.” “We talk about the girls, the future, and how to get out.” “I think about what I would do if I had a wife and children and didn’t have a job.” “Ganja makes you more conscious. You meditate about life’s problems and don’t talk about silly things.” “When I began to smoke it made me check out my life, take better care of my moneys and put sporting down.” This is underscored by the statement of a man in his twenties who said he occasionally gives *ganja* to his 10-year-old brother to develop his sense of responsibility: “After he smokes he becomes more conscious, he cannot roam in the streets any more like a little boy.” Younger smokers of
both sexes also report the sensation of well-being and sociability. “It makes you feel lively and nice. Like you’re in the world again.” “I feel more merry, not lonesome.” “It makes you sing better and your brains quick.”

*Ganja* use carries other values of considerable sociological significance. On one level, smoking is considered adventurous by the adolescent boy: by participating in an illegal practice, even though it is widespread among his elders, the young smoker believes he is demonstrating courage, defiance and, most importantly, manhood. In subtle ways, the smoking of *ganja* is considered by the young as almost a *rite de passage*, an audacious act signifying transition from adolescence to maturity. On another level, particularly for males from the lowest socioeconomic rung of the society, smoking symbolizes camaraderie, equality and belonging; it is a sign of friendship and trustworthiness. Confidence can be placed in a man who joins in a smoke; those who will not potentially have “something over you.” In such a milieu, adult males who do not smoke *ganja*, with the exception of avowed Christians and those who “don’t have the head for it,” are considered deviant. Often “loners” and withdrawn non-smokers are seldom included in male gatherings and are sometimes even thought of as simple-minded or deranged. By well-established custom, *ganja* smoking is primarily a social activity limited to age, work and status peers. Therefore, among the rural poor, to smoke is to conform; not to smoke may mean social marginality – the reverse of the situation found at higher levels.

*Ganja in relation to the larger society*

As can be seen from the main outlines of the *ganja* complex sketched thus far, for the majority of the Jamaican population, it is an institution of social and cultural consequence. An individual’s perception and evaluation of *ganja* is directly related to his social level and to his social aspirations. *Ganja* use, particularly smoking, implies participation in an illegal activity uniformly judged to be “bad” and “lower class” by those with higher status. Public display of such behavior by well-established or socially aspiring individuals leaves them vulnerable, by jeopardizing their chances for keeping or obtaining high status and the benefits derived from such position. These individuals, consequently, avoid and publicly denounce
ganja smoking as well as other forms of lower-class behavior such as common law marriage and obeah practices. The mobile or socially aspiring individuals of the lower class, designated as “Low level” in Table 1, are the most revealing in this regard. A rise in status requires the deliberate shedding of lower-class patterns of behavior. Ganja use, obviously one such pattern, is one of the easiest to shed. Withdrawal from ganja seems to take less effort and to cause fewer adjustment problems than withdrawal from tobacco. As a result, the mobiles are almost never heavy ganja smokers, very rarely are even regular smokers, are sometimes occasional smokers and more often are non-smokers. Table 1 provides quantitative confirmation of this pattern. The following case illustrates the context of individual withdrawal from ganja:

Henderson, 36, began smoking ganja at 18. For most of his young adult life, he was without steady employment and with little land, a member of the lowest socioeconomic stratum. During this period, he set up a household with a common-law wife and fathered four children. At 28, Henderson’s economic fortune began to change for the better, with help from his increasingly prosperous stepfather. He managed to procure a permit for migrant farm work abroad and worked for several seasons in the United States. While he was away, his common-law wife attended a training school, was certified as a seamstress and began to take in sewing. With their savings, Henderson purchased additional land, a cow and other farm animals. At about this point, he discontinued smoking ganja. At the age of 35, he was granted a contract to grow tobacco for a local company and is now one of the few contract farmers in the district. Henderson has definitely moved up the socioeconomic ladder and is aspiring even higher.

He and his common-law wife have just been legally married, and are enlarging their house. Henderson has given up habitual ganja smoking, though he continues to use it in the form of tea, but to avoid buying ganja from anyone in the village he has started to grow his own supply. His old acquaintances often press him to take a draw, and occasionally he does, so that they will not think he is “in any way funny.” For Henderson, these occasions, while decreasing in frequency, have become increasingly embarrassing.
Ganja in Jamaica is not simply a question of use by the poor and non-use by the affluent, since the distinctions between the users of ganja for tea or tonic, on the one hand, and for smoking, on the other, are of critical social relevance. Drinking ganja tea or tonic is a private act, and these preparations are considered medicinal brews with no adverse side effects. As such, they are quietly accepted by many throughout the country, though households of the high social standing take precautions to conceal even this from their neighbors. Sizeable numbers of individuals, especially from the higher socioeconomic levels, however, believe ganja smoking is detrimental to physical and mental health, that the practice is a threat to the society, a corrupting influence on already “lazy” and “rude” young men and that it incites to criminal activity. Many middle-class Jamaicans believe that ganja is responsible for an island-wide increase in delinquency and crimes of violence, robbery and mugging. This belief is supported by newspaper reports of disorderly and criminal acts alleged to have been perpetrated under the influence of ganja; but this view does not wholly apply in rural areas, for the simple reason that the great majority of smokers, even the heavy ones, are known to be peaceful, otherwise law-abiding citizens. However, there are the few who transgress the law; when these are smokers, ganja is claimed to be the cause.

When possession of ganja is linked to a crime by the police or by public prejudice, smokers offer reasonable, alternative explanations of the criminal action.

In a neighboring district, a teenage boy murdered his mother, mutilated her body with a machete, and then hid her along the river bank under a pile of leaves. The body was soon discovered and the boy was arrested. Ganja was found in his possession, and he admitted to having been smoking for several days before the murder. Non-smokers categorically asserted that ganja “mad the boy” and led him to kill his mother. Smokers contended that the boy’s “brains were no good,” that “he was funny to begin with.”

Even as aberrant conduct may sometimes be attributed to obeah, so ganja serves to bear the blame for certain categories of behavior. When an individual is known to be a ganja smoker, any misbehavior
on his part is almost unquestionedly attributed to “the herb.” Often obeah and ganja are the alternative explanations, depending considerably on the socioeconomic position of the person who is interpreting the event, as in the following examples:

Two men, Ashton and Jones, suffer from occasional psychotic episodes during which they shout, curse and wildly wave their machetes. Ashton is particularly terrifying, and villagers stay well out of his way during his “spells.” Middle-level people insist that Ashton’s condition is a direct result of heavy ganja smoking; other ganja smokers say that though Ashton smoked a “whole heap a weed,” he went “mad” from studying obeah books.

Jones’ behavior during his irrational periods is far less menacing than Ashton’s, and he is the subject of considerable teasing, not unsympathetic, by villagers. His brother Ken, however, a well-established middle-level resident of the community, is the object of criticism and the envy of lower-level villagers, who say that Jones was once a respected citizen with land and a good trade, but that his jealous brother Ken used obeah to “mad” him and thus to usurp all that their father had willed to Jones. These villagers do not attribute Jones’ mental condition to ganja, but Ken and his friends, who find Jones’ bizarre behavior a social embarrassment, insist that his use of ganja caused him to go insane.

Lambert, a 42-year-old heavy smoker, reports that, while in his twenties, he was confined to the mental hospital for several months. Villagers aver that his hospitalization was a result of smoking ganja, but he knows that it came about because of a “duppy” (spirit of a dead person) that was “set” on him through obeah. He maintains that in the hospital his recovery was speeded by his procuring and smoking the best kali he has ever had. Since that time, he has had no recurrence of the “illness” and he has continued smoking regularly.

Smokers assert that ganja is considerably less likely to lead to antisocial behavior than rum and other hard spirits. It is observable that the serious smoker is careful in his conduct, lest his friends and companions feel that he cannot handle ganja, that his ‘brains are too weak.’ Few, if any, frequent the country rum shops, which cater to
the “big men” of the district – land authority agents, policemen and the like. In rural Jamaica generally, hard drinking by the well-off is fairly common, particularly on weekends – and much boisterous and abusive behavior is tolerated. While the true incidence of ganja-induced misconduct may well be much less than that of rum, upper-class social and cultural prejudice blocks objective comparison and assessment.

Avoidance of what is held to be vulgar is seen as part of the way to gain and keep control over lower-ranked individuals. Among the well-established, the man who exercises authority over others is expected to be without reproach. He may not smoke ganja with his workers in the evening if he expects to direct their labor effectively the next day, though he may drink beer or rum with his employees or other social inferiors. A subtle moral discrimination is evident in this avoidance of smokers, for non-smokers who are regular tea drinkers may consume as much or more ganja as the “rude boys.” It is not the ganja, per se, but the method of consumption that is condemned.

For the upper social groups, injunctions against smoking in public are not difficult to observe. Recreation, visiting and other leisure activities follow class lines, and social distance between the different levels is maintained. The well-established man does not often find himself in situations which would oblige him, out of courtesy, to take a draw or accept a spliff, and his social inferiors would hesitate to smoke ganja in his presence.

Enforcement of the ganja laws is the responsibility of the Jamaica Constabulary. Police assigned to rural areas are generally aware of ganja cultivation and use but are content to leave well enough alone as long as their district remains peaceful. Police action against ganja cultivators and users would rouse resentment among the villagers and rapport would suffer, so the police act against ganja violators only when they must, as when complaints are forwarded from headquarters; and even then, they may elect to blunt the point of a raid by leaking a warning of its coming or by choosing to destroy only a small portion of a ganja field. On occasion the police have to act out of simple public embarrassment:

A teenage boy walking along the “main” was asked by the corporal to step inside the station house. The boy, carrying a stick of ganja, thought he was about to be searched and arrested.
Panicking, he pulled the stick from his pocket and threw it on the ground. Because other villagers were looking on, the corporal arrested the boy for possession, clearly reluctantly. All he had wanted was a bit of information about someone else.

Even when provoked, however, the police may refrain from arrest. One constable confided that he tries to ignore the "rude boys." When they insult him by blowing smoke in his face, he merely rebukes them. Some cultivators suggest that police behave as they do because they use ganja themselves and even sell plants they confiscate in raids on ganja fields.

Police love it. They arrested a man and took 20 crocus bags of ganja. When the case finally came to court, there was only half a crocus bag left. Police smoke more and make more money from ganja than anyone.

Whatever the truth, one old man and his wife frankly admit that they do not have to plant or buy ganja for tea because their constable són brings it home regularly.

As detailed in the preceding chapter, the origins of the ganja laws appear to have been class biased and their elaboration over time haphazard and without serious social or medical justification. Even if this were not the historical case, the laws are so viewed by the using population who see legislation and enforcement as arbitrary, directed against the laboring classes and used for purposes beyond the intent of the law itself: Some hold the relatively benign opinion that "government" simply does not understand that ganja does no harm and does not lead to violence. Most, however, cling to a conspiratorial view: "government" is antagonistic to poor people having anything good and will take ganja away; or legalizing ganja would adversely affect the "big men" who make "plenty profits" from the plant; or medical doctors are against ganja because users do not get sick; or, more generally, ganja laws make the vulnerable people of Jamaica more vulnerable.

Granting the biases in these opinions, they nevertheless reflect wider feelings of societal abuse harbored by Jamaican laboring people. Perhaps more significantly, these sentiments signal the danger of institutional dissonance and misunderstanding in a sharply stratified and culturally divided society.
Acute effects of ganja smoking in a natural setting

The opportunity to collect data on acute reactions to ganja smoking developed in the course of a year-long study of a small agricultural community, one of seven localities intensively examined by the anthropological team. The objective of this part of the field studies was to probe the relationship of ganja smoking to individual behavior in the total community context. Specifically, the research was planned to focus on the following: the effect of ganja use on agricultural production, exchange relationships and market economy; the acute effects of ganja smoking on energy expenditure in agricultural work; and the relationship of land utilization and the effects of ganja on work.

The scope of these questions called for techniques and a methodology which transcended the usual approaches of more traditional ethnographic research. Consequently, not only were data collected through census interviews, in-depth enquiries about household composition, kinship networks, land tenure, occupation and income, but also comprehensive records were made of daily activities throughout one week in each of 16 sample households. Special field techniques included 24 audiotapes (90 minutes each), 100 videotapes (30 minutes each), several films (11 minutes each) and objective measurements of energy expenditure and food intake. Extensive data were also collected in medical surveys, laboratory studies of energy metabolism and selected interviews and observations.

The community in which this study was carried out is not unique or even unusual in rural Jamaica. Situated in the shaly and deeply
ravined foothills of the Blue Mountain range, the approximately 300 inhabitants live in 85 households along a winding dirt road. Subjected to the vagaries of somewhat unpredictable weather, these small farmers cultivate the steep slopes as best they can but are at a considerable distance from major market centers, given the available means of transportation. There is no piped water or electricity, and there are few public services. As elsewhere in the island, the farmers supplement their income from the land by taking additional jobs, such as day work on road construction and on neighboring farms; some are also part-time specialists, such as cooks, barbers, butchers, carpenters, painters, sawyers, shoemakers and tailors; and many farmers also grow ganja as a small cash crop. About 60 percent of the farm incomes from regular market crops were under J$300 (US$359) in 1970. A very few relatively large-scale farmers were able to gross nearly J$1000 (US$1,197).

Approximately 70 percent of the available land is under cultivation, the remainder being either inarable or used for pasture. The lands lie on slopes of between 10 to 40 degrees, with thin layers of soil over basic shale, slightly acid, low in phosphorus and potash. Well over half of the cultivated lands are put to mixed crops. Farm holdings are scattered over the hills, and only a few of the more fortunate families have been able to build homes on the land they cultivate.

At the time of the study, a large majority of the residents were using ganja in tea or tonic or to smoke. Women are principally tea and tonic drinkers—few of them smoke; probably 75 percent of the men use tea and tonic and 50 percent smoke as well. Most users smoke in their homes and yards, in their fields, in the yard or field of a trusted friend or in a secluded area in the bush. Few smoke in public. Those who prefer to smoke in a group usually go to the bush, where they can enjoy “good and loving thoughts” in relaxed companionship, safe from the police, about whom there are credited acts of brutality. Arrest in itself is not considered shameful, and prison terms are seen as a part of life. Since no smoker or grower is actually unknown, crackdowns are made at the will of the police. When impending arrests are discovered in time, cannabis crops and caches are destroyed.

Most men had their first smoke in the company of older friends, several during visits to the capital. Others had their first smoke with
older family members or friends while working in the fields. Several men who had an unpleasant first experience (nausea or dizziness) declined a second trial. Their decision was supported by the accepted opinion that “His brains are too light, so he can’t use it.” Those who are successfully initiated soon establish routines of use according to availability and intention. Cultivation requirements generally condition the routine of men who are accustomed to smoke during arduous labor. When the ganja crop ends in January and household incomes decrease in April and May, smoking patterns frequently decline as well.

Average doses vary among smokers; some stop when they “first feel it affecting the brain,” but heavy users often smoke as much as they can get. Dosage is related to the type of activity and the quality of ganja available: “When you smoke in the field, you don’t smoke enough to block up [become intoxicated]. When you get the real thing [quality] a few draws will do it.” Duration of the effects may vary from as short as one-half hour to five or six hours – for the “strong stuff.” Most smokers report effects lasting two or three hours, though not all agree that effects are in any way profound. Some say they feel “no different” after smoking, while others report marked changes in their patterns of thought.

Within this context, this study concentrated on making an objective assessment of the widespread Jamaican belief, strongly voiced in this community, that ganja use enhances physical energy and, consequently, work productivity. The field program of videotaping was introduced after several months of participant observation and interviewing. During this period, a representative sample of ganja-and non-ganja-using households was selected for participation in the videotape coverage and associated research procedures. The research goals were explained to the members of these households and the videotaping demonstrated. Only those who gave their consent were included in the study. Further, the participants were assured that they could view all the tapes and have the right to require the destruction of any they considered objectionable. The activities of each participant, including conversations with others, were recorded

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1. In this part of the project, smokers are defined as follows on the basis of frequency: a heavy user as one who smoked 3 to 8 times a day (up to 31 grams). A moderate user smoked 1 to 3 times a day (.5 to 2 grams). A light user smoked once a week to once a day. Very light users smoked less than once a week.
chronologically during his waking hours for 14 days. At least three audio-visual records of each major activity were obtained with each participant, before, during and after smoking ganja. As the investigation went on, there were frequent tape-viewing sessions for the participants and, at their request, for their families and friends.

Four case studies, based on the analysis of videotapes recorded in the field, are presented: the first on the effects of moderate ganja smoking on physical movement and energy requirements during work; the second on the effects of heavy smoking; the third and fourth explore individual variations. These cases are followed by the results of the laboratory and quasi-laboratory testing in the field.²

Case study I: John Ellis

Ethel and John Ellis³ (34 and 40 years old, respectively) who live with their seven children, control nine and one-quarter acres purchased in bits and pieces since 1963. In 1970 Ellis had two and one-half acres in carrots, one-half acre in red peas and one-half acre in congo peas. On another three acres he had standing crops of coffee, cocoa, pimento, bananas, breadfruit, coconut, citrus, avocado and ganja. He did 189 days of farm work during the year and otherwise was employed on road construction and as a wage laborer, house painter and occasionally on other odd jobs. Mrs. Ellis took the farm produce weekly to vend in the market. The children also worked, helping their parents break rock to sell to road construction crews.

Although limited by its cost and legal risks, ganja is a common item in the Ellis household. During the harvest season between August and December, Ellis smokes a spliff as often as three times a day; when he awakes at 6:30 A.M., before lunch at 11:30 A.M. and before dinner, between 3:00 and 5:00 P.M. The ganja he prefers has a Delta-9-THC

2. Toward the end of the field research nutritionists from Teachers College, Columbia University, joined the project with a Kofani-Michaelis gas collection device and a Lloyd gas analyzer to conduct tests of villagers at work. As these individuals worked, the gas collector strapped to their backs, consumed air in liters was measured every 30 seconds. Samples were immediately analyzed to determine percentages of oxygen and carbon dioxide in the expired air for precise measurement of energy expenditure. At the same time, videotape records of physical movements over measured periods of time were obtained for relation to energy expenditure data. Ultimately, their patterns of movement before, during and after smoking ganja were compared and microanalyzed to one-tenth of a second.

3. All names in the study are pseudonyms.
content of between 2.6 and 3.0 percent, and his usual dose is .8 gm per smoke. He and his family also drink tea and rum tonic mixtures made from ganja roots and green leaves to “keep away sickness.” Between January and August, when his own crop is gone, Ellis smokes perhaps two or three times a week or less. The rationale he offers for this unavoidable change in his pattern of daily use is that: “If you smoke it too much it spoils you. You become like a Rasta man, ignorant and violent.” Ellis smokes only when alone or among trusted friends, never in public. The effects of smoking on his work can be seen in a well-documented period of observation.

On April 20, 1971, Ellis used a hand fork to turn a piece of land for sowing of carrots and turnips. Beginning at 8:15, he worked without rest for 60 minutes. He covered 6.55 square feet per minute. At 9:15 he sat down and smoked .91 gm of ganja with a Delta-9-THC content of 3.0. He smoked for three minutes and 15 seconds, inhaling 11 times. The average draw was 2.445 seconds long, and he held each inhalation for an average of 4.23 seconds. He returned to work at 9:25 and continued for 77 minutes, turning 2.6 square feet per minute. From 10:42 until 10:49 he rested and smoked one-fourth of a cigarette. Then, between 10:49 and 11:52, he worked steadily, turning 4.6 square feet per minute. At 11:52 he smoked one-half of a cigarette, worked a bit more, and then relaxed into sleep for 85 minutes. Upon awakening at 1:45, he stopped work for the day.

To assess the acute effects of ganja, a microranalysis of Ellis’ movements before, just after and well after smoking was undertaken. The onsets and endings of his movements were marked on the videotape to one-tenth of a second for six different parts of his body. Changes in rhythm after smoking indicate that the internal organization of movements is considerably less complex after smoking. Taking the six body parts separately there were, on the average, 30 percent fewer points of change per second—stop-start movements—after smoking.

The data from 12 tests carried out in the field with a Kofrani-Michaelis gas collection device and a Lloyd gas analyzer indicate that the number of kilocalories (i.e., expended rather than consumed calories; one kilocalorie is equal to one calorie) used by Ellis in completing a task was altered significantly after smoking ganja.
Kofrani-Michaelis tests: John Ellis

<table>
<thead>
<tr>
<th>Activity</th>
<th>Kilocalories before smoking</th>
<th>Kilocalories after smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning with fork</td>
<td>5,724 per square(^4)</td>
<td>7,632 per square</td>
</tr>
<tr>
<td>Weeding small grass</td>
<td>11,983 per acre</td>
<td>15,437 per acre</td>
</tr>
<tr>
<td>Weeding cow grass</td>
<td>27,600 per acre</td>
<td>31,500 per acre</td>
</tr>
</tbody>
</table>

After smoking, Ellis expended 31,500 kilocalories to weed one acre of cow grass. Before smoking he covered the same space while expending fewer kilocalories. Here the relationship between the effects of *ganja* on the organization of his movement and his destructive metabolism, on the one hand, and the food consumption, on the other, becomes of interest.

During the week of January 18, 1971, for example, Ellis weeded his “middle year” congo pea crop. Daily work patterns were similar throughout the week with regard to type of activity and space covered per unit of time, but his energy expenditure was greater on January 20, 1971, the only day during that week that Mr. Ellis was able to obtain *ganja*. At 8:25 A.M. he smoked .6 gram and at 10:48 A.M., .5 gram of *ganja* with a Delta-9-THC content of 2.25. He covered the same number of square feet per minute (an average of 11.79 square feet per minute) on all four work days; but on January 20, he expended a total of 1.1 more kilocalories per minute during field work. The preliminary findings indicate that the use of cannabis increases energy requirements.

To insure the fact that the alterations were related to *ganja* rather than fatigue or other possible factors, many examples of behavior for each subject were compared before and after use in various settings and at various times. All subjects smoked immediately before beginning work during several test days. On other days they began work without smoking. The *ganja* patterns were evidenced no matter what the research schedule.

Between January and July, a period during which Ellis no longer had any of his own *ganja*, he smoked only moderately during heavy agricultural work. Nevertheless, *ganja* effects were evident. For this entire period, by extrapolation from precise

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4. A square is one-tenth of an acre. The figures for squares and acres were extrapolated from precise measurements of expenditure in smaller space units.
measurements, it may be assumed that he expended 133,010 kilocalories in 472 hours. If he had not smoked ganja, theoretically, at the same cost in kilocalories, he might have increased his cultivated acreage by one or two squares.

During the lean period between January and July, Ellis expended fewer kilocalories per hour during fewer work hours; the additional kilocalories were expended in recreational activity. By contrast, between August and December, with his own ganja crop available, Ellis smoked heavily.

Summary figures on consumption indicate that Ellis takes, in 1,135,040 calories per year.¹ There are monthly variations that correlate with variations in the total yearly energy expenditure of 1,121,000 kilocalories; and there are weekly and daily variations related to differences in day-to-day work patterns. Some of these differences probably result from acute and cumulative effects of smoking ganja.

Theoretically, Mr. Ellis could have made more efficient use of energy and time in the exploitation of his lands. However, the significance of any increase in the number of acres under cultivation, for example, is hardly evident. The land is steep, and the soil is shallow and relatively barren. Crop yields are low. Extremes of weather destroy young plants, and mature crops are often lost due to insufficient manpower at harvest time. The work itself is arduous, repetitious and boring. The possible financial compensation is inadequate to Ellis' way of thinking. In fact, an increase in total cultivated acreage would probably be of little value.

Ellis' participation in group field labor adds another dimension to his ganja smoking pattern. On February 3, 1971, he and 11 other farmers turned a field together. Just after arriving for work most of the men shared some ganja provided by the host farmer. For about 10 to 15 minutes, they "worked like demons," talking and laughing as they moved up the hill, forks piercing the earth in a close, straight line. Gradually, a quiet, dogged concentration replaced the gaiety. The sharp lines of work formation changed as one after another moved away to carry out his task alone. The work pace steadied and then slackened as fatigue set in. One of the farmers called for "more

¹ The figures on calories and kilocalories were extrapolated from daily information on consumption and expenditure covering the first 180 days of 1971.
herbs," and spliffs were rolled and passed around. The acute effects were again animation and action in concert, followed by quiet concentration, gradual dispersal and fatigue. The process was repeated twice more for a total of four times during the day. Finally, after a filling lunch served in the field by the farmer's wife and an hour of work in the late afternoon, the party ended, with the happy host satisfied with a "fine piece of forking."

During the periods when the men worked in concert during this day, they gave an impression of togetherness, of social cohesiveness. Ellis said: "Relations with other people are better when I smoke. I feel good about everybody."

Case study II: Poppy Silver

Poppy Silver, aged 50–55 years, is head of a household consisting of Miss Mandy, his common-law wife of 12 years, their son and one of Poppy's young nephews. They live in a relatively well-built, well-kept house in the valley. Poppy's lands are four acres inherited from his father, one-quarter acre which he purchased in 1965 and a rented one-half acre. Miss Mandy inherited another one and three-quarters acres from her mother. She rents one acre and has standing crops on several acres of family land. Poppy farmed one and two-thirds acres in 1970 and rented out two and one-half acres. Besides being a farmer, Poppy is the most sought-after village sawyer, does carpentry on occasion, boils sugar in the only remaining private wet-sugar mill in the area and cooks a fine goat curry for local holiday feasts.

Poppy began smoking ganja among friends rather late in life, at age 25, and has smoked daily ever since, occasionally growing and selling some. He smokes three or four, sometimes six or seven, times daily, as much as an ounce a day. He links his use of ganja to work and to social relations with other smokers. Ganja, he says, makes him think better and work better, he feels stronger and more motivated in both work and play, he can concentrate deeply and has a feeling of well-being after smoking. Objective measurements contrast with Poppy's perceptions, particularly about the productivity of his agricultural work.

During the heavy use season, August to December, Poppy smoked one-half to one ounce daily in 3 to 8 smoking sessions.
Between January and August his pattern of use was more sporadic. The variation depended to some degree upon Poppy's financial status and the availability of ganja, which becomes scarce before and during early summer; as the congo pea crop slackens in January and yams slow by April, income decreases as well. Variations in frequency of use are also related to activity patterns and cumulative effects. When Poppy works steadily among friends at weeding, sawing or carpentry, he likes to smoke frequently.

During a Kofrani-Michaelis gas test before smoking, Poppy weeded with a machete and cleared 192 square feet in 12 minutes, expending 48.12 kilocalories. At this rate he would expend 10,923.24 kilocalories in weeding one acre in 45.4 hours. In a comparable test after smoking, he weeded 116 square feet in 14 minutes, expending 44.11 kilocalories. At this rate he would expend 17,106.7 kilocalories to cover one acre in 71.1 hours. Extrapolating from these figures, Poppy would work 1.56 times longer to weed an acre of bananas after smoking and would use 1.56 times as many kilocalories. In weeding mixed grass with a hoe, it was found he would work 2.29 times longer on an acre and would require 2.16 times as many kilocalories. Microanalysis showed that Poppy made as many movements after smoking as before, but that many movements were unproductively repetitive.

Kofrani-Michaelis tests: Poppy Silver

<table>
<thead>
<tr>
<th>Activity</th>
<th>Kilocalories before smoking</th>
<th>Kilocalories after smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeding bananas</td>
<td>10,923 per acre</td>
<td>17,107 per acre</td>
</tr>
<tr>
<td>Weeding with hoe</td>
<td>10,444 per acre</td>
<td>22,572 per acre</td>
</tr>
<tr>
<td>Turning soil</td>
<td>6,966 per acre</td>
<td>7,210 per acre</td>
</tr>
</tbody>
</table>

These effects are significant in terms of yearly agricultural pursuits. Given ample lands and energy, Poppy hypothetically could cultivate at least an additional acre without increase of energy expenditure. However, he feels that he is already working to capacity; besides, he much prefers to work as a sawyer, a carpenter or a handyman, all wage-labor jobs.

By contrast, after smoking ganja, he uses his energy resources more economically at the saw than with a hoe, thus exploiting the extended period of concentration many workers associate with
ganja. In sawing, there is little variation in movement, because of the machine-like pattern established by two partners. For this reason, periods while he worked with the saw were used to study the effect of smoking ganja on Poppy’s thought processes. Poppy was schooled (as were other subjects) to respond to a signal every 15 seconds with a brief statement about his thoughts. When Poppy sawed without having smoked, 60 to 65 percent of his thoughts were about his daily life; 15 to 25 percent about his environment, the weather; 25 to 35 percent about the tasks at hand, sawing; and little, if any, was given to abstract subjects, such as religion. When he sawed after smoking ganja, 60 to 70 percent of his thoughts were about the techniques of sawing, the saw itself, getting the job done, or his own body; 15 to 20 percent were about important matters in his daily life, his crops, a carpentry job or meeting with people; 5 to 10 percent related to religion, dreams of travel and abstract thoughts. The effect of ganja, then, reverses Poppy’s thought content from concentration on daily life to concentration on the work task.

Carpentry is a social task for Poppy; when he joins other men to construct a kitchen shed, an outhouse or a truck body, ganja enlivens the social spirit of the day. The effects are similar to those described in Ellis’ cooperative farm work. Just after smoking, there is lively movement, succeeded by concentration on the work, periods of immobility and staring, then eventual fatigue. During quiet, staring periods, Poppy said: “feeling good,” “feel fine,” “just all right.”

Case study III: Elija Bickman

Elija Bickman, a 37-year-old bachelor, regularly visits his long-time companion and their children, whom he supports by court decree. He owns seven acres of inherited land, three of which he shares with a brother, and works as a handyman for a local shop owner. Elija has smoked two to four times a day since 1962. “Always liked ganja,” he says, “makes me feel happy, and whatever work I have to do, I do it.” However, his spliffs are small (.25 to .30 gm), and he inhales deeply but quickly—much like a cigarette smoker—the quantity he consumes classifies him as a light-to-moderate smoker. “If you smoke a lot,” he says, “it will ruin your body. It makes you look meager, you spend money on weed and have no money to buy food.”
By titrating the dosage he is able to experience what he considers to be the "good effects" of ganja while avoiding undesirable effects, such as hunger or fatigue. The effects of these smaller doses on his work pattern, energy expenditure and states of consciousness are insignificant. During seven weeding and forking days in the field, he varied very little in either rate of movement or space covered before and after smoking. Summaries of variations in number of movements per minute show an average variation of 0.0519 before smoking; after smoking the variation is 0.0551. While weeding before smoking on one sample work day, Elija expended 313 kilocalories per hour; after smoking he expended 330 kilocalories per hour. Total space covered in two weeding days was practically equal: 5180 square feet in 325 minutes on the non-smoking day and 4600 square feet in 300 minutes on the smoking day.

To determine whether these minimal variations could have been peculiar to Elija, regardless of ganja quantity, he was asked to perform a repetitive task without having smoked and was then given one gram of high quality ganja (Delta-9-THC content 2.5) and asked to repeat the task. The average variation in movements before smoking was 0.0510; after smoking, the average was 0.0661. During the first 40 minutes of the task performed without having smoked, the average variation in his body movements was 0.0461. In the same time period of the task repeated after smoking, it was 0.0794. Elija said he was "really red."

In the Koefrani-Michaelis tests, he was again given ample amounts of ganja; variations in kilocalorie measurements and space covered before and after smoking were significant.

Koefrani-Michaelis tests: Elija Bickman

<table>
<thead>
<tr>
<th>Activity</th>
<th>Kilocalories before smoking</th>
<th>Kilocalories after smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning the soil</td>
<td>6,865 per square</td>
<td>10,528 per square</td>
</tr>
<tr>
<td>Weeding</td>
<td>14,110 per acre</td>
<td>21,073 per acre</td>
</tr>
</tbody>
</table>

Comparison of Elija's thought content before smoking and after smoking, lightly and then heavily, may be seen in the following table:
Acute effects of ganja smoking in a natural setting

Thought content analysis: Elija Bickman

<table>
<thead>
<tr>
<th>Thought content</th>
<th>Before smoking</th>
<th>After .2 gram</th>
<th>After 1 gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Societal issues, religion, fornication</td>
<td>0%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>People, crops, food, etc.</td>
<td>63%</td>
<td>53%</td>
<td>18%</td>
</tr>
<tr>
<td>Immediate environment</td>
<td>13%</td>
<td>13%</td>
<td>20%</td>
</tr>
<tr>
<td>The work task, itself, getting it done, techniques of the task, effects of work on the body</td>
<td>24%</td>
<td>31%</td>
<td>58%</td>
</tr>
</tbody>
</table>

As indicated, the effects of small doses of ganja in the natural setting are negligible, while concentration on the work task itself increases markedly after smoking.

Case study IV: Virgil Fisher

Virgil Fisher, the community’s “healthy warrior,” is 36 years old, single, 5 feet 10 inches tall and weighs over 180 pounds. He has no land but supports himself by day labor on the roads and in the fields and has friends and relatives who give him food and shelter. The son of a ganja dealer, he has been familiar with ganja since childhood. By the time he was 14 he was “thieving” some for his older friends and taking an occasional draw himself. He liked feeling the “bright spirit” once a day or so and soon became a regular smoker, having two or three smokes a day. By the time he was 20, he was smoking “four-six-seven-eight times a day.” During the heavy crop season, he smoked “all the time, very hard.” Virgil said that smoking helps him work faster, enables him to concentrate harder and gives him a big appetite. Although preferring to smoke in solitude, because “too many people start foolish arguments when they smoke, and if you share with everybody you don’t get enough for yourself,” he had a regular smoking companion who was also a heavy user.

During research days with Virgil at work in the fields, along the road and in the yard, his ability to consume large amounts of ganja without evident behavioral effects was impressive. He did have brief periods of talking and laughter just after smoking and occasionally went to sleep for two to three hours; but most often went through his day in the quiet, unobtrusive manner his neighbors had come to expect of him. Virgil’s reaction to ganja in kilocalories expended per unit of space was similar to that of other users.
Kofrani-Michaelis tests: Virgil Fisher

<table>
<thead>
<tr>
<th>Activity</th>
<th>Kilocalories before smoking</th>
<th>Kilocalories after smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeding</td>
<td>20,137.45 per acre</td>
<td>22,760.1 per acre</td>
</tr>
<tr>
<td>Turning soil</td>
<td>4,983.3 per square</td>
<td>10,528 per square</td>
</tr>
</tbody>
</table>

However, variations in his movements per minute or in the organization of movements are not evident. In two comparable tests, the variation per minute is .0584 before smoking and .0601 after smoking – an insignificant difference. It may be that Virgil is able to compensate in his behavior after smoking, or that, for some reason, he does not experience strong effects at all; the former is more likely since the characteristic changes in his kilocalories pattern do occur after smoking.

It may be concluded from these case studies that ganja smoking alters the rate and organization of movement and increases the expenditure of energy; that behavioral changes related to light or moderate smoking (defined by either dose or frequency) are not significant in agricultural work over extended time periods; that behavioral changes related to heavy ganja smoking are significant in agricultural work over extended time periods; and that both moderate and heavy smoking reinforce social cohesiveness during work in group situations.

The cases presented were selected as examples of contrasting patterns of smoking to emphasize the importance of the quantity and frequency of use and of the “set and setting.” In the following summaries of more inclusive data, this emphasis remains crucial. These findings indicate that the worker is more intense and concentrated after smoking which may suggest that he does a better weeding job because he makes sufficient movements to root every weed. An alternative explanation would be that the extra movements merely compensate for cumulative inaccuracies and the consequent necessity to repeat movements. Several farmers who watched themselves on videotapes commented on the thoroughness of their work, supporting the first view. The findings, however, indicate that the total number of kilocalories required per field task is greater on the average after smoking. The differences are more significant in heavy work tasks and are directly related to dosage.

Well into the field work, five subjects from the community were
tested in an air-conditioned laboratory in Kingston. Three of the subjects were exercised on a Monark cycle ergometer at an initial power load of 30 watts; the load was increased by 30 watts at three-minute intervals until each subject's maximum performance level was reached. Inspired air, respiration and heart rates, expired air and pedal rate were continuously monitored during exercise. After full recovery, each subject smoked one gram of ganja (Delta-9-THC content 2.8), waited for the effect and then repeated the test, the interval between tests being approximately one hour. Under the same laboratory conditions, two of the subjects cycled eight kilometers at a speed and in a manner of their choice against a flywheel load of one kilogram. Similar measurements were made and the tests were repeated after smoking. The cumulative work done was plotted against oxygen consumption and the results can be summarized as follows:

1. There was no evidence of any effect of smoking ganja on the relationship between oxygen consumption and work done, i.e. metabolic function was not altered.

2. After smoking, both resting and submaximal exercise heart rates were increased, but increased work had very little additional effect on the heart rate. Prior to smoking, heart rates, in general, were low during rest, increasing markedly as exercise levels increased; but after smoking heart rates were much higher during rest and remained high throughout the tests.

3. Submaximal exercise ventilation was normal in all but one subject and was unaltered by smoking. The tidal volume was reduced during exercise after smoking and breathing frequency increased.

4. During exercise, submaximal ventilation and submaximal oxygen intake in two subjects were higher before smoking, and submaximal heart rates were higher after smoking. That is, exercise performance appeared to have been reduced by smoking.

A second series of tests with the Monark ergometer were carried

6. Ambient temperature range 21–30°C, relative humidity 70 percent, altitude 500 feet.
out in the field, to reduce the effects of the long trip to the city. Six subjects cycled an ergometer distance of 50 kilometers on two successive days at a speed and in the manner of their choice against a flywheel load of one kilogram. Three subjects smoked one gram of ganja (Delta-9-THC content 2.1) before the test on the first day and did not smoke any on the second day. The process was reversed with the other three subjects. Another six subjects were asked to complete the test only once. Three of these smoked ganja before the test, and three were controls.

Pedal rate, distance and time were monitored every 30 seconds during 14 of the 18 sets of tests. In four, they were monitored every five minutes. Results show that variations in pedal rate and distance per minute are, on the average, greater after smoking. Average speeds did not change, though in five of six compared subjects, the time required to complete the 50 kilometers was greater after smoking because of longer rest intervals.

The results of these tests support the first conclusions—that of the Kofrani-Michaelis field studies—that the primary effects of smoking ganja are on patterns of movement and energy expenditure. Depending upon the task, there are greater numbers and/or variations in numbers of movements per unit of time after smoking. These variations are probably related to effects of smoking on tidal volume/breathing frequency, especially under maximum work load conditions. It is also possible that smoking affects the heart rate/stroke volume relationship during work that involves exercise of any kind and that cardiac output is reduced, but additional research would be needed to demonstrate this.

Average food consumption data indicate that men in the community, both smokers and non-smokers, eat enough to meet their expenditure requirements. Average anthropometric values on height, weight, arm circumference and triceps skinfold thicknesses corroborate this. They are 66.6 inches, 151.7 pounds, 28.5 centimeters and 5.0 milimeters, respectively. No significant differences appear when averages for heavy smokers and non-smokers are compared.

7. These figures are strikingly similar to those from other agricultural areas in Jamaica and food consumption data for women and children indicate that the health of the adult male farmers is maintained at considerable nutritional expense to other household members.
Medical examinations of representative male smokers and non-smokers revealed no significant differences. No serious disease was detected, except for one case of hypertension, and there were no evident signs of nutritional deficiencies. Hemoglobin levels were adequate and serum protein values (albumin and globulin) fell within normal limits. Intestinal parasites, when present, resulted in only light infections. These examinations indicate that ganja smoking does not affect general physical health, supporting clinical findings presented in the following chapters.

The effects of smoking ganja appear to reveal a significant relationship between energy expenditure and the exploitation of land resources. Members of the 85 households in the community hold a total of 406.5 acres. In ten of these households, lands are cultivated to capacity by men or women who expend the minimum number of kilocalories to exploit maximum land resources. None of the farmers in these households is a heavy smoker of ganja, and three smoke in light to moderate amounts. Maximum land is exploited in six other households with the help of wage laborers. In one of these, the male household head is a heavy smoker, as well as the village dealer. He is able to hire field hands to do most of his farming.

For 27 households the available lands are only partially cultivated. In 16 of these the household head is too old or infirm to fully exploit the land. Four of the farmers pursue other occupations: two are shopkeepers, one a minister and one a politician. Three are alcoholics who rarely work. The remaining 4 are heavy smokers of ganja: one never farms and the others farm small holdings and perform odd jobs.

For another 48 households, adequate lands for cultivation are unavailable. Men in seven of these households experience a great deal of enforced leisure, taking odd jobs when possible. Twenty-eight potential farmers are old and/or infirm; two men are alcoholics; one farmer is also a part-time butcher. Three of the household heads are women who cannot maintain their acreage alone. Seven households are headed by heavy ganja smokers, four of whom prefer odd jobs to farming.

Since these are correlative conditions, no firm conclusions can be

8. Among community women, hypertension and anemia are fairly common, and several women were obese.
drawn concerning relationships between land exploitation patterns and smoking *ganja*. In the community, the heavy use of *ganja* seems to alter the relationship between perception and action in a way that affects the movement-energy-production pattern of the agricultural system. The effect appears to be consistent with the sociocultural context. Briefly, a significant number of potential farmers hold small acreage, some of which, due to the slope degree and soil type, is unsuitable for farming. Of the lands which can be cultivated, some must be left in ruinate for extended periods to avoid severe decline in crop yield. As a result, many farmers cannot farm extensively. In a village in which the ethical code includes hard work and long hours in the fields, such farmers face a dilemma. They can leave the area to search for work elsewhere, and some do. They can complete their own cultivation quickly and obtain other work in their spare time; some also do this, but such work is generally difficult to obtain. Or, they can work longer hours in the field and expend more calories than would be necessary to exploit the available land. In this way, they maintain a subjective impression of enhanced physical efforts and capacity for work. The heavy use of *ganja* during agricultural pursuits may be related to this alternative.

*Lest this tentative conclusion be misunderstood as a suggestion that a direct and constant relationship exists between the heavy use of *ganja* and decreased production, a word of caution is in order. The exploitation of the effects of *ganja* in the community is systemic, and this tentative finding cannot be analyzed in proper perspective without regard to the context in which they occur. Given another context, one can expect different conclusions concerning their significance.*

More recent studies of *ganja* smokers on Jamaican sugar cane plantations indicate that cane loaders may exploit the rapid movements following smoking to load more cane in a given time period. Additional research is required to examine the effects of *ganja* smoking according to work task and sociocultural context. In all Jamaican settings observed, the workers are motivated to carry out difficult tasks with no decrease in heavy-physical exertion, and their perception of increased output is a significant factor in bolstering their motivation to work.

As a response to the felt need for systematic information on the effects of long-term cannabis use, clinical studies were undertaken of thirty chronic ganja smokers and thirty matched non-smokers. As late as 1970, Barber pointed out that “unfortunately the long-term consequences of cannabis use are not definitely known at the present time” (1970:101). This conclusion is echoed in the 1972 reports of both the Canadian Commission and the United States National Commission. Given this dearth of knowledge, the clinical phase of the Jamaica Project, carried out in the University Hospital, was planned to include a wide range of physical, psychological, neurological and psychiatric studies. The nature of the clinical sample and the results of the medical examinations are presented in this chapter; the results of the psychological, neurological and psychiatric studies appear in following chapters.

Subjects for the clinical sample were selected from four of the seven localities studied intensively by project anthropologists: two coastal communities with economies based on fishing and agriculture, a farming settlement in the southeastern hill country and the corporate area of Kingston. The sample thus is generally representative of the more important socioecological zones of Jamaica.

Given the illegality of ganja and the lack of any statistics dealing with ganja use, it was impossible to employ conventional random sampling techniques to recruit subjects. The only practical alternative was purposive sampling of adult males, whose ganja smoking, or non-smoking, status was known to the project field workers, and who met the other criteria of the research design: age, socio-
economic status and residence. Implementation of the design was made possible by the long-term residence and involvement in the four localities by project anthropologists who identified, selected and recruited subjects for the clinical studies. Technically, the sample is non-random and, therefore, no statistical claim is made as to its representativeness of the total population. It is a sample drawn from two matched groups, ganja smokers and non-smokers, for the purpose of scientific comparison.

With ganja smoking a pervasive phenomenon among working-class males, there was no difficulty in locating thirty smokers who fit the demographic requirements of the research design. It is the rare working-class Jamaican male who has never smoked ganja at some time during his youth. By the same token, valid controls were harder to find. Consequently, controls were defined as confirmed non-smokers who may have had some limited experience in the past, usually a few experimental attempts at ganja smoking.

Smokers were defined as chronic users if they had been smoking a minimum of three spliffs daily for a minimum of ten years. At the time of admission to the University Hospital, subjects were asked to supply a sample of the ganja they usually smoked. These samples were forwarded to NIMH laboratories for assay of tetrahydrocannabinol (THC), the psychoactive ingredient of cannabis.

Participation in the hospital phase of the study was on a completely voluntary basis. Once having been selected tentatively by the field workers as known smokers or controls with matching criteria for sampling, subjects were invited to participate in the program of clinical studies. Examination procedures were explained, and reciprocal individual gains were discussed with potential subjects. All subjects were offered a complete medical examination with treatment at the University Hospital, if indicated, for any disabilities. They were also offered compensation of J$50.00 for the week's stay in the Hospital, guarantees of confidentiality of all data collected and round trip transportation from their home community to the University Hospital.

Motivations for participation in the clinical studies tended to be

1. After entry into the hospital, it was found that two smokers had less than a ten-year smoking history.
2. See Appendix III for the range of potency of the samples for cannabinol, cannabidiol as well as Δ⁴ and Δ⁹-THC.
both economic and medical. While the monetary compensation was modest, it was a relatively unusual opportunity to collect a lump sum of cash. More importantly, most of the participants had never undergone a medical examination and wanted to know their health status. Smokers, in particular, were eager to establish the fact that they had not been harmed by chronic use of ganja. On the other hand, many potential subjects were unwilling to participate in the study. This reluctance was due in part to difficulties in arranging to leave work and family, unwillingness to leave familiar surroundings and, for some, the fear of hospitalization. Potential smoker subjects tended to be more cooperative and amenable to participation than potential controls. Little fear seemed evident among smokers of possible legal risk once confidence in the resident anthropologist had been established. The following are typical comments by ganja smoking subjects:

Weed don't have no effect. I know that is why they call us up here to test if it leave any effect in human body. But it don't leave none. Only thing is that if you have work to do it makes you do it.

I came to UC [University Hospital] about the herb to test me. Come test me because me wait upon a man to say nothing wrong with herbs.

In view of the illegality of ganja, an agreement was made with the University of the West Indies (UWI) administration that no studies of the acute effects of cannabis would be undertaken at the University Hospital. In accordance with this agreement, the smokers in the sample were asked to abstain from the use of ganja while they were in the hospital. To the best of the project staff's knowledge, only one smoker did not observe this condition. This subject independently decided that the effects of ganja could not be "tested" unless he were smoking and managed to procure some ganja, presumably for the sake of science:

Hear me why I smoked it [at the hospital]. Although you told me not to, I feel if a man is tested for a week and he doesn't smoke, it makes no sense. When a man tests me I want him to find evidence that the smoke comes off me, and if it's effective [negative] it will show up. But if I stop smoking when I leave to go to the hospital, there's nothing left [to test].
One member of the social science team was given the responsibility of interviewing in depth each subject involved in the clinical phase of the study. This lengthy, open-ended but structured interview, completed either shortly before admission to the hospital or on the first day of admission, concentrated on critical dimensions of the subject's life history. The interview was designed to generate the vital social and attitudinal characteristics of the respondent so that systematic comparison of smoker and control sub-samples could be made, as well as to provide some measure of the representativeness of the sample to the Jamaican working-class population from which it was drawn. Statistical summaries of life history data—age; residence; family background; education; occupational patterns; property holdings and income; marital history; religious, political and other organizational affiliations; ganja history, experience and attitudes; alcohol patterns; and charges for violating the laws of Jamaica—are presented in Appendix IV.

To summarize these demographic and sociological characteristics, the sixty men in the hospital sample were mainly small farmers, fishermen and artisans from rural areas and 'casual laborers from the Kingston area. All but two were employed, either full- or part-time at the time of the study. Ranging in age from 23 to 53 years with an average age of 34, they had had from less than 1 year to 9 years of formal schooling. Mean number of years of schooling completed was 4.5 years, and the mean in educational attainment was the third grade in primary school.

Ages of subject at first ganja smoking experience ranged from 8 to 36 years. Smokers tended to have their first ganja-smoking experience earlier than controls. All the smokers had their first experience before the age of 20, as contrasted with controls, of whom nine first smoked ganja before age 20 and nine after age 20 (12 of the controls reported they had never smoked). The difference is statistically significant at .006. Regular use for the smoker group began at ages ranging from 9 to 25 years; average age was 15 years. Thus an earlier experience with ganja may be considered predictive of later regular use.

For the thirty smokers, duration of regular ganja smoking ranged from 7 to 37 years, with a mean of 17.5 years. The number of spliffs consumed per day at the time of the study ranged from 1 to 24, with an average of 7. Based on these frequencies, light use is
defined as 1 to 4 spliffs a day; moderate use as 5 to 8 a day; and heavy use as more than 8 a day. Ganja smokers who used the chillum pipe consumed from 1 to 25 pipeloads per week, with an average weekly consumption of 14 pipeloads. Ganja samples submitted by smoker subjects showed a Delta-9-THC content ranging from .7 to 10.3 percent (mean weight) with a mean of 2.96 percent. Potency of ganja consumed varied according to availability, season and grade.

Ganja is customarily mixed with tobacco in both spliffs and chillum pipes. Twenty-seven ganja smokers also smoked tobacco cigarettes, while eleven controls did not smoke tobacco at all. All but one of the smokers reported that they also use ganja in teas and tonics for medicinal purposes, and, while specific information on this subject was not collected from controls, some undoubtedly used ganja in these forms. Aside from ganja, no drugs such as cocaine, heroin, LSD, opiates, amphetamines, barbiturates or datura (jimson weed) were taken by sample subjects. Smokers tended to drink less alcohol than controls and to prefer ganja to alcohol for regular consumption.

Excluding the ganja related history, the sub-samples of smokers and controls are well matched on demographic criteria. The comparability of subjects in the sub-samples reinforces confidence in the clinical results and analyses. In key sociological variables such as family background, education, occupational history, marital patterns and organizational activities, no statistically significant differences were found between the two sub-samples. Only in religious affiliation and church attendance do differences appear. Since these two variables were not used as criteria for sample selection, the differences do not distort the matching design but rather provide additional clues about smoker/non-smoker status.

The profile of demographic characteristics confirms the representativeness of the sample. The data indicate, variable by variable, that the clinical subjects have the same general configurations as those found among the working people of Jamaica as a whole. A comparison of the sample data with the ethnographic literature on Jamaica, the staff’s own previous research in the area and relevant national statistics indicate with more than reasonable certainty that the characteristics of the sample, taking sex and age into consideration, are in no way deviant or skewed from those of the general working-class population.
For the statistical evaluation of the findings in the following sections, a category of "occasional smokers" was developed to account for any controls in the sample who gave any verbal indication that they had had a limited but relatively recent experience with *ganja* smoking. Nine subjects were included in this category: eight controls and one smoker who was smoking less than one spliff per day at the time of the study. The precaution was taken to examine all the statistical data on the basis of the two-way (smoker/non-smoker) and three-way (smoker/occasional smoker/non-smoker) divisions of the sample. Comparison of these two sets of tabulations for every research variable showed no statistically significant differences except in hematology and lung function. In these areas, both sets of tabulations are presented in Chapter VII; elsewhere three-way sample breaks are not included.

The physical status of the sixty subjects was assessed by detailed medical history and examination, heart and lung radiography, electrocardiography, respiratory function tests, blood chemistry, liver and renal function, hematologic and treponemal serology and chromosomal studies. In addition, blood and urine samples were sent to the Rockland State Research Center laboratory in New York, for analysis of peripheral thyroid hormone levels and steroid excretion study.

No significant physical abnormalities were found except in two smokers. One had a long history of bronchial asthma, and in the other the finding was "Jamaican neuropathy" – a syndrome of pyramidal tract damage and (often) posterior column damage, with or without retrobulbar neuropathy and eighth nerve deafness; its etiology is uncertain, but it may be an atypical form of neurosyphilis (Cruickshank, Montgomery and Spillane 1961). There is nothing to suggest that these disabilities were in any way related to *ganja*. Blood pressures in both groups were within normal limits. X-rays of the heart and lungs were normal in both groups, except for some scarring of the lungs in one of the controls.

Smokers and controls were well matched in height and in age, but the smokers were an average of seven pounds lighter, suggesting the possibility that habitual smoking causes some suppression of appetite. Eleven of the controls and three of the smokers did not smoke tobacco cigarettes, though tobacco is regularly added to *ganja*.
The clinical studies

Serological tests for treponematosis were positive in a higher proportion of the controls (57 percent) than in the smokers (37 percent). Both these figures, however, are within the range of positive serology found in a random sample of the adult male population in various parts of Jamaica; the higher figure occurs in the rural areas of some parishes where clinical yaws used to be common. Even in recent years, surveys of treponemal serology in prepubertal school children in these rural areas give a positive rate of up to 25 percent, as against less than one percent in Kingston (Ashcroft et al. 1967), strongly suggesting that treponemal infection (yaws) still occurs, but at a sub-clinical level.

Minor ECG abnormalities were found in 30 percent of both smoker and control groups, which may indicate the prevalence of cardiomyopathy that has been recognized in Jamaica (Stuart and Hayes 1963; Fodor et al. 1964); of uncertain origin, the immediate cause may be attributable to an obliteratorive disease of the small coronary vessel (M. Campbell et al. 1971). A high incidence of arteritis has been reported in Moroccan cannabis users, and this may contribute to the common occurrence of tropical foot ulcers in chronic smokers; however, heavy tobacco consumption, often associated with the use of cannabis, also precipitates or aggravates obliteratorive vascular disease. Of the heavy tobacco smokers (that is, over 20 cigarettes a day), two of the controls and two of the ganja smokers had ECG changes, while there were three controls and nine ganja smokers with normal ECGs.

No significant differences were found in cortisol secretion or in peripheral thyroid hormone levels between the smokers and controls. Results of chromosome studies of 18 smokers and 15 controls revealed no statistically significant differences between the groups. The incidence of mild chromatid breakage, 2.36 percent (smokers) and 2.90 percent (controls) was no higher than that found randomly in other studies at the University of the West Indies. Findings for these tests are given in Appendix V.

The hematological examination revealed eosinophilia in eleven subjects, seven non-smokers and four smokers, which is not statistically significant. No significant differences were found in the other

3. Arteritis has been reported in a number of cannabis smokers in Morocco who smoked 10 to 15 pipes daily (Sterne and Ducastaing 1966).
hematological tests, with the exception of hemoglobin and monocyte count values. The sickle cell trait was present in four subjects.\textsuperscript{4}

Elevation of the liver enzymes, serum glutamic oxalacetic transaminase (SGOT), and serum glutamic pyruvic transaminase (SGPT) was found in seven subjects – three non-smokers and four smokers – but was not very high, and does not indicate significant liver damage.

The major statistically significant differences between the thirty chronic smokers and the thirty controls were found only in hemoglobin and monocyte count values and in post-exercise bicarbonate levels. Several interesting trends were noted in the respiratory function findings, indicating an association between frequency and duration of smoking \textit{per se} (tobacco cigarettes, \textit{ganja} spliffs and pipes) with respiratory function and differences in blood chemistry (See Table 7). Chronic, heavy smokers (more than 20 tobacco cigarettes per day, plus chronic \textit{ganja} smoking by spliff and/or pipe) are at greater risk of functional hypoxia, i.e., deficiency of oxygen in body tissues. No other statistically significant differences were established. Findings in respiratory function and hematology are examined in detail in the following chapter.

\textsuperscript{4} The expected percentage of phenotype occurrence was:

<table>
<thead>
<tr>
<th>Phenotype</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>.85</td>
</tr>
<tr>
<td>AS</td>
<td>.10</td>
</tr>
<tr>
<td>AC</td>
<td>.02</td>
</tr>
</tbody>
</table>

indicating heterozygous sickle cell trait

indicating heterozygous hemoglobin C

The observed distribution of phenotypes of our sample ($N = 59$) does not differ significantly from the expected percentages reported by W.E. Miall \textit{et al.} (1967).

The incidence among our sample is presented below:

<table>
<thead>
<tr>
<th>Phenotype</th>
<th>AA</th>
<th>AS</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td>25</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Occasional smokers</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Non-smokers</td>
<td>21</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

($N = 59$)
Chapter VII

Respiratory function and hematology

Respiratory function

The following tests were administered to measure respiratory function of all subjects; Forced Vital Capacity (FVC), which measures the total capacity of the lungs (i.e., the maximum volume of gas which can be expelled during a forced expiration starting from total lung capacity); Forced Expiratory Volume (FEV₁₀), which measures the volume of air expired from the lungs during the first one second period of forced expiration, following a full inspiration; and Peak Flow Rate (PFR), which measures the lungs’ expiratory performance in liters per minute.¹

Two other diagnostic measures were calculated: (1) FEV₁₀ expressed as a percentage of FVC was calculated to assess degree of obstruction in the lungs; and (2) predicted FEV₁₀ and FVC values were calculated for subjects, based on group, age and height averages; expression of the obtained values as a percent of the predicted values provides an indication of the subjects’ ventilatory capacity.

¹ On arrival of the subject in the anesthetic laboratory, a polythene tube, called a “cannula,” was inserted under the skin under local anesthesia. The following measurements were taken with the patient at rest:
1. Arterial blood gases and pH.
2. Measurements of FEV₁₀ and expiratory peak flow rate (PFR).
3. Pulse rate.

The patient was then exercised on a treadmill for three minutes. Exercise was sub-maximal. During the last minute of the three-minute period, a sample of arterial blood was withdrawn for arterial blood gases and pH studies. Immediately following the exercise the pulse rate was recorded at one-, two- and three-minute intervals.
**FVC.** The range of values for the sixty cases was from 2147 to 5060 mls of vital capacity. The findings indicate that smoking is related to a lowered forced vital capacity, although it is not significant at the .05 level (see Table 1). More than twice as many ganja smokers as non-smokers had FVC values in the lowest third of the values obtained, that is, values of 3507 mls or less.

Table 1. *Forced Vital Capacity*

<table>
<thead>
<tr>
<th>Smoker</th>
<th>(FVC) mls</th>
<th>3507 or less mls</th>
<th>3600-4000 mls</th>
<th>4050 or more mls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>8</td>
<td>8</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(70%)</td>
<td>(40%)</td>
<td>(40%)</td>
<td>(50%)</td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(30%)</td>
<td>(60%)</td>
<td>(60%)</td>
<td>(50%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(33 1/3%)</td>
<td>(33 1/3%)</td>
<td>(33 1/3%)</td>
<td>(100%)</td>
<td></td>
</tr>
</tbody>
</table>

p = .091  
df = 2

This trend is less clear when occasional smokers are classified as a separate group, reducing the correlation from -.24 to -.11 (see Table 2). There were a few more occasional smokers in the higher than in the lower FVC range, either because they were younger or, possibly, because of lessened risk of occasional smoking.

Table 2. *Forced Vital Capacity*

<table>
<thead>
<tr>
<th>(FVC) mls</th>
<th>Smoker</th>
<th>Occasional smoker</th>
<th>Non-smoker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3507 mls or less</td>
<td>12</td>
<td>2</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>3600-4000 mls</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>4050 or more mls</td>
<td>8</td>
<td>10</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>

p = 0.371  
df = 4
90 Respiratory function and hematology

$FEV_{1.0}$. The range of $FEV_{1.0}$ values was from 1427 to 4175. Comparison of smokers and non-smokers revealed a $-0.20$ correlation between smoking and $FEV_{1.0}$. Although the findings are not significant at the .05 level, there is a trend for smokers to have lowered respiratory volume values. Almost twice as many smokers as non-smokers had $FEV_{1.0}$ readings in the lowest third of the scores (see Table 3). By redividing the subjects into three groups (smoker/occasional smoker/non-smoker), the trend decreases in strength (see Table 4). Again, this may be due to the lower average age of subjects in the occasional smoking group or to lower frequency of smoking (Kory et al. 1961).

**Table 3. Forced Expiratory Volume**

<table>
<thead>
<tr>
<th>(FEV$_{1.0}$) mls</th>
<th>2797 mls or less</th>
<th>2800-3300 mls</th>
<th>3290 mls or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>13 (65%)</td>
<td>9 (45%)</td>
<td>8 (40%)</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>7 (35%)</td>
<td>11 (55%)</td>
<td>12 (60%)</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>20 (33 1/3%)</td>
<td>20 (33 1/3%)</td>
<td>20 (33 1/3%)</td>
<td>60 (100%)</td>
</tr>
</tbody>
</table>

p = .247

**Table 4. Forced Expiratory Volume**

<table>
<thead>
<tr>
<th>(FEV$_{1.0}$) mls</th>
<th>2797 mls or less</th>
<th>2800-3300 mls</th>
<th>3290 mls or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>12 (60%)</td>
<td>8 (40%)</td>
<td>8 (40%)</td>
<td>28 (47.7%)</td>
</tr>
<tr>
<td>Occasional smoker</td>
<td>1 (5%)</td>
<td>4 (20%)</td>
<td>4 (20%)</td>
<td>9 (15%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>7 (35%)</td>
<td>8 (40%)</td>
<td>8 (40%)</td>
<td>23 (38.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>20 (33 1/3%)</td>
<td>20 (33 1/3%)</td>
<td>20 (33 1/3%)</td>
<td>60 (100%)</td>
</tr>
</tbody>
</table>

p > .50

**df = 4**
PFR. The range of PFR values was from 240 to 632 liters per minute. Nearly twice as many smokers as non-smokers fell into the lowest third. Thirteen smokers and seven non-smokers had readings of less than 480 liters per minute, giving a non-significant correlation of \(-.27\) between smoking and peak flow in liters per minute \((p = .11, df = 2)\). Separating the nine occasional smokers from the others, five fall into the population third with the highest peak flow measurement; this reduces the correlation between smoking and peak flow rate to \(-.13\). However, there is some association between smoking and lower PFR values.

*FEV/FVC ratio.* No major differences were found in the FEV/FVC ratios of either the ganja smoker or non-smoker groups, or when the sample was divided into three groups. Significance levels were over .5 in both cases.

While the incidence of respiratory tract infections is increased in cigarette smokers (Haynes, Krstulovic and Bell 1966), the deleterious effects of smoking on ventilatory capacity is measurable by spirometry but is less convincing, probably because spirometry measures disease of the large bronchi. (This is supported by other unpublished data of Haynes, Krstulovic and Bell, and Wilson 1960 and Read 1961.) There is abundant evidence that cigarette smoking reduces lung compliance, as measured by the body plethysmograph, and distribution of air to the lung, as measured by distribution studies.

A finding of a normal FVC and reduced FEV\(_{1.0}\) would probably indicate some obstruction of the lung, as in asthma or bronchitis. The fact that proportionate decreases existed in FEV\(_{1.0}/FVC\) ratio (occurring equally among smokers and non-smokers) would suggest that neither smokers nor non-smokers had obstructive ventilatory defects. Some other factor must have been responsible; possible causes include cardiomyopathy, pulmonary scars and pulmonary fibrosis.

*Predicted vs. actual FEV\(_{1.0}\) and FVC measures.* Predicted group average FEV\(_{1.0}\) and FVC measures were calculated, based on the average age and height of each group (smoker, occasional smoker and non-smoker). The actual FEV\(_{1.0}\) and FVC values obtained for each of these groups, the predicted values based on the Jamaican prediction formulae\(^2\) and the deviation from the predicted values are presented in Table 5.
Table 5. *Predicted vs. actual FEV*$_{1.0}$ *and FVC*

<table>
<thead>
<tr>
<th></th>
<th>Mean age</th>
<th>Mean height</th>
<th>Predicted FVC (L)*</th>
<th>Actual FVC (L)</th>
<th>Deviation</th>
<th>Predicted FEV*$_{1.0}$ (L)</th>
<th>Actual FEV*$_{1.0}$ (L)</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td>34.1 yrs</td>
<td>1.68 m</td>
<td>4.32</td>
<td>3.60</td>
<td>(- .72)</td>
<td>2.99</td>
<td>2.91</td>
<td>(- .08)</td>
</tr>
<tr>
<td>Occasional smokers</td>
<td>31.0 yrs</td>
<td>1.67 m</td>
<td>4.36</td>
<td>4.08</td>
<td>(- .28)</td>
<td>3.06</td>
<td>3.50</td>
<td>(+ .44)</td>
</tr>
<tr>
<td>Non-smokers</td>
<td>35.0 yrs</td>
<td>1.69 m</td>
<td>4.44</td>
<td>3.82</td>
<td>(- .51)</td>
<td>3.00</td>
<td>3.07</td>
<td>(+ .07)</td>
</tr>
</tbody>
</table>

* L = Liters

Smokers as a group deviate most from their predicted FVS values (in a negative direction) and least from their predicted FEV*$_{1.0}$ values (in a positive direction). Occasional ganja smokers seem to fare the best, showing the least negative deviation from their predicted FVC values and having an average FEV*$_{1.0}$ measure above that predicted for the group. Amount of ganja smoked does not appear to be a highly predictive variable of lung function as measured by FVC and FEV*$_{1.0}$.

**Arterial blood gases: Resting and post-exercise.** Arterial blood gas determinations of the percentage of oxygen (pO$_2$), carbon dioxide (pCO$_2$), hydrogen (pH), bicarbonate (pHCO$_3$) and pulse rate measurements were made at rest and immediately after exercise. While the only statistically significant difference found between smokers and controls on these measurements was on the post-exercise bicarbonate measure, the following tendencies were of interest.

2. Standards have been developed in several laboratories for the prediction of FVC, FEV*$_{1.0}$, and other lung function measurements. The formulae used for the prediction of normal Jamaican values are:

- \[ \text{FEV}_{1.0} = 2.31 \times \text{(Height in meters)} - 0.026 \times \text{(Age in years)} - 0.006 \]
- \[ \text{sd} = .49 \]
- \[ \text{FVC} = 2.84 \times \text{(Height in meters)} - 0.022 \times \text{(Age in years)} - 0.300 \]
- \[ \text{sd} = .53 \]

These values are used to compute the normal values and deviation from the normal values for this study. Those interested in calculating the deviation on the basis of predicted American male values are referred to the prediction formula in Kory et al. (1961) or to Morris, Koski and Johnson (1917).
1. The pO₂ of smokers at rest tended to be lower than that of controls; this tendency was found in both the two-way and three-way distributions, indicating poorer oxygenation of blood for smokers.

2. At rest, pCO₂ also tended to be lower among smokers, which would suggest that hypoventilation is not the cause of resting hypoxia among smokers.

3. Values of pH and pHCO₃, at resting state, did not discriminate between smokers and controls.

4. There were no differences between smokers and controls in pulse at rest.

5. After exercise, there was a leveling of pO₂ values between smokers and controls, indicating improved oxygenation among smokers.³

6. The tendency for low pCO₂ in smokers, as opposed to controls, was maintained after exercise, although this was less marked when occasional smokers were excluded.

7. After exercise pH tended to be lower among smokers.

8. After exercise pHCO₃ was lower among smokers at a statistically significant level. This suggests that the observed post-exercise drop in pH among smokers results from the accumulation of acid metabolites rather than from respiratory insufficiency.

9. There were no differences between smokers and controls in pulse after exercise.

The possibility of contamination of the above findings by the factor of tobacco smoking led to the construction of a series of indices relating to smoking:

1. Number of tobacco cigarettes smoked per day.

2. Number of years ganja was smoked.

3. Number of ganja spliffs currently smoked per day.

4. Number of ganja pipes currently smoked per day.

5. Total amount of ganja smoked per day (with one pipe and one spliff having equal weight in the index).

6. Total smoking per day (with one tobacco cigarette, one ganja cigarette and one pipe having equal weight in the index).

³ A similar phenomenon is seen in people with reversible degrees of bronchitis, which improves with exercise.
Respiratory function and hematology

This range of indices was developed to measure the effects of smoking per se, both cumulatively over time and currently per unit of time.

Using the above indices, a correlation matrix was computed relating the values of these indices to several medical variables. Tables 6 and 7 depict the correlation coefficients, including significance levels, of the indices with selected medical variables measuring lung function, blood gas levels, and blood and urine chemistry.

Eleven controls did not smoke tobacco; dislike of smoking was, in fact, one of the reasons given for not smoking ganja. If the non-smoking population were withdrawn from the cross-tabulations of the laboratory findings, measures of pulmonary function and hematology on ganja smokers and tobacco-smoking controls might be comparable. The findings may be an indictment of smoking per se. Further correlations should be computed separately for ganja smokers and non-smokers in order to complete the analysis. Correlations of number of years of ganja smoking with FEV$_{1.0}$ and peak flow are significant at the .05 level. However, since ganja is customarily smoked with tobacco the significance of this finding with respect to ganja is questioned.

Table 6. Lung function by smoking indices

<table>
<thead>
<tr>
<th></th>
<th>FVC</th>
<th>FEV$_{1.0}$</th>
<th>FEV/FVC Ratio</th>
<th>PFR (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of tobacco</td>
<td>.145</td>
<td>.154</td>
<td>.041</td>
<td>.132</td>
</tr>
<tr>
<td>cigarettes per day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>smoked ganja</td>
<td>-.337</td>
<td>-.364*</td>
<td>-.156</td>
<td>-.372*</td>
</tr>
<tr>
<td>Daily spliffs</td>
<td>.204</td>
<td>.146</td>
<td>-.041</td>
<td>-.115</td>
</tr>
<tr>
<td>Daily pipes</td>
<td>-.287</td>
<td>-.260</td>
<td>-.012</td>
<td>-.090</td>
</tr>
<tr>
<td>Daily spliffs and pipes</td>
<td>-.017</td>
<td>-.037</td>
<td>-.026</td>
<td>-.154</td>
</tr>
<tr>
<td>Cigarettes and ganja</td>
<td>.079</td>
<td>.092</td>
<td>.038</td>
<td>.055</td>
</tr>
<tr>
<td>combined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Indicates significance at .05 level.

4. No information was obtained on the number of years tobacco had been smoked. Cigarette smoking generally preceded ganja smoking. However, no means is available for estimating length of cigarette smoking for non-ganja smokers. Tobacco is always added to both ganja spliffs and pipes, for a "better" smoke.
Table 7. Blood gases by smoking indices

<table>
<thead>
<tr>
<th></th>
<th>Resting</th>
<th>On exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pO₂</td>
<td>pCO₂</td>
</tr>
<tr>
<td>Number of tobacco cigarettes per day</td>
<td>.016</td>
<td>-.216</td>
</tr>
<tr>
<td>Number of years smoked ganja</td>
<td>.128</td>
<td>.154</td>
</tr>
<tr>
<td>Daily spliffs</td>
<td>.185</td>
<td>-.044</td>
</tr>
<tr>
<td>Daily pipes</td>
<td>.354</td>
<td>-.107</td>
</tr>
<tr>
<td>Daily spliffs and pipes</td>
<td>.339</td>
<td>-.119</td>
</tr>
<tr>
<td>Cigarettes and ganja combined</td>
<td>.022</td>
<td>-.249</td>
</tr>
</tbody>
</table>

* Indicates significance at .05 level.
** Indicates significance at .01 level.
*** Indicates significance at .001 level.
In summary, excepting lowered bicarbonate levels after exercise, there are no major statistical differences between ganja smokers and non-smokers with respect to pulmonary function, as measured by FEV\(_1.0\) and FVC and arterial blood gas and pulse.

Findings mitigate against obstructive ventilatory defects for smokers. The pO\(_2\) of smokers at rest tends to be lower than that of controls, and concomitant low pCO\(_2\) excludes hypoventilation as a cause of resting hypoxia. After exercise, differences between smokers and non-smokers on pO\(_2\) values tend to disappear with a persistency to a low pCO\(_2\) in smokers; and correlations between tobacco, ganja and combined smoking indices show a decrease in association between FEV\(_1.0\), PFR and number of years or quantity of ganja and cigarettes smoked. These findings should be considered in relation to the blood chemistry findings which follow.

**Hematology**

Complete blood counts and chemical analyses were carried out on each of the sixty subjects. Normal Jamaican values were used to define normal, above normal and below normal categories.\(^5\)

In most cases this division yielded insignificant differences between smokers and non-smokers. To compute statistical differences, the values of the total sample were also divided into thirds, regardless of normal value; another cross-tabulation was done to compute the significance of any possible tendencies of the smoker or non-smoker population to fall at one or the other end of the value continuum. In

5. Jamaican normal values, presented below are, in some instances, quite different from American values:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Jamaican Normal values</th>
<th>American Normal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Hemoglobin (Hb)</td>
<td>13.5–18 g/100ml</td>
<td>12–14 g/100ml</td>
</tr>
<tr>
<td>Packed Cell Volume (PCV)</td>
<td>40–54%</td>
<td>47 ± 7%</td>
</tr>
<tr>
<td>White Blood Count (WBC)</td>
<td>4,000–7,000</td>
<td>4,000–11,000</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>40–75%</td>
<td></td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>20–45%</td>
<td>25–33%</td>
</tr>
<tr>
<td>Monocytes</td>
<td>2–10%</td>
<td>2–6%</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>1–6%</td>
<td>1–3%</td>
</tr>
<tr>
<td>Basophils</td>
<td>&lt;1%</td>
<td>1%</td>
</tr>
<tr>
<td>Erythrocyte Sedimentation Rate – Westergren (ESR)</td>
<td>0–6 mm/hour</td>
<td>0–12 mm/hour</td>
</tr>
<tr>
<td>Platelets</td>
<td>150,000–400,000/mm(^3)</td>
<td>200,000–400,000/mm(^3)</td>
</tr>
</tbody>
</table>
both types of analysis, significant differences between smokers and controls are limited to blood hemoglobin and monocyte count values. Findings on individual measures follow.

Blood Hemoglobin (Hb). Hemoglobin values for the sample ranged from 12 to 17 grams per 100 ml of shed blood. Forty-two of the sixty subjects had Hb values above the upper normal limit of 14 grams per 100 ml. Differences between smokers and non-smokers were significant at .023 level. There were six cases of smokers in the high 17 + g/100 ml range; only one non-smoker fell into this category. Thus, smokers exhibited a lowered capacity of the blood to engage oxygen.

Packed Cell Volume (PCV). Values of from 38 percent to 54 percent were obtained from the total subject population. Only four fell outside the Jamaican normal PCV values. There were five times as many smokers as non-smokers in the high (50–55 percent) range group. This reconfirms the hemoglobin results, suggesting lowered oxygen-engaging capacity of hemoglobin due to hypoxia induced by smoking. This suggestion is strengthened by similar findings of a recent study to determine the relationship of cigarette smoking to tissue hypoxia (Sagone, Lawrence and Balcerzak 1971).

Total White Blood Count (WBC). Thirty-two of the 60 subjects had white blood counts of 7,000 or higher. There was no significant difference between smokers and controls. One possible explanation of the elevated WBC in a significant number of subjects would be the presence of clinically inapparent infections.

White Blood Cell Counts. Cross-tabulations of the percentage values of granular (neutrophil, eosinophil, basophil) and non-granular (lymphocyte, monocyte) leukocytes in the blood reveal few differences between smokers and non-smokers. Although a large number of subjects were outside of Jamaican white blood cell normal values, only the monocyte and eosinophil counts indicated consistent differences between smokers and non-smokers.

As indicated in Table 8, nearly twice as many smokers as non-smokers had low (0–1 percent) monocyte values; almost twice as many non-smokers as smokers fell in the high (5–9 percent) category.
The distribution failed to reach significance; however, there is no available clinical interpretation for these lowered values among the smokers. When divided into the three-way sample in Table 9, the monocyte count difference approaches significance.

Table 8. WBC: Monocytes

<table>
<thead>
<tr>
<th></th>
<th>0–1</th>
<th>2–4</th>
<th>5–9</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>11</td>
<td>13</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(61.1%)</td>
<td>(52.0%)</td>
<td>(35.3%)</td>
<td>(50%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>7</td>
<td>12</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(38.9%)</td>
<td>(48.0%)</td>
<td>(64.7%)</td>
<td>(50%)</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>25</td>
<td>17</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>(30.0%)</td>
<td>(41.7%)</td>
<td>(28.3%)</td>
<td>(100%)</td>
</tr>
</tbody>
</table>

p = .302
df = 2

Table 9. WBC: Monocytes

<table>
<thead>
<tr>
<th></th>
<th>0–1</th>
<th>2–4</th>
<th>5–9</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>9</td>
<td>13</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>(50%)</td>
<td>(52.0%)</td>
<td>(35.3%)</td>
<td>(46.7%)</td>
</tr>
<tr>
<td>Occasional smoker</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>(33.3%)</td>
<td>(12.0%)</td>
<td>(0%)</td>
<td>(15.0%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>3</td>
<td>9</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>(16.7%)</td>
<td>(36.0%)</td>
<td>(64.7%)</td>
<td>(38.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>25</td>
<td>17</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>(30.0%)</td>
<td>(41.7%)</td>
<td>(28.3%)</td>
<td>(100%)</td>
</tr>
</tbody>
</table>

p = .013
df = 4

Twice as many smokers as non-smokers had low (0–1 percent) eosinophil counts; twice as many non-smokers as smokers were in the high (7–10 percent) category, as noted in Table 10. Again there is no available clinical interpretation of lowered values among smokers.
Table 10. **WBC: Eosinophils**

<table>
<thead>
<tr>
<th></th>
<th>0-1</th>
<th>2-6</th>
<th>7-10</th>
<th>11-25</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>12 (70.6%)</td>
<td>15 (42.9%)</td>
<td>2 (28.6%)</td>
<td>1 (100%)</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>5 (29.4%)</td>
<td>20 (57.1%)</td>
<td>5 (71.4%)</td>
<td>0 (100%)</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td>17 (28.3%)</td>
<td>35 (58.3%)</td>
<td>7 (11.7%)</td>
<td>1 (1.7%)</td>
<td>60 (100%)</td>
</tr>
</tbody>
</table>

\[ p = .110 \]
\[ df = 3 \]

As shown in Table 11, three times as many non-smokers as smokers had high (1–2 percent) basophil counts, a finding contrary to the monocyte and eosinophil counts. Again this difference failed to approach significance.

Table 11. **WBC: Basophils**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1-2</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>28 (53.8%)</td>
<td>2 (25.0%)</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>24 (46.2%)</td>
<td>6 (75.0%)</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td>52 (86.7%)</td>
<td>8 (13.3%)</td>
<td>60 (100%)</td>
</tr>
</tbody>
</table>

\[ p = .225 \]
\[ df = 1 \]

No differences were found between smokers and controls in either lymphocyte or neutrophil counts. Although no difference appeared in neutrophil count between the two groups, even the tendency toward lowered neutrophil counts among smokers might be responsible for the consistent marginal differences between the two groups in monocyte and eosinophil counts. Breakdowns of WBC into 'smoker, occasional smoker and non-smoker gave similar results.
Erythrocyte Sedimentation Rate — Westergren (ESR). As indicated in Table 12, the erythrocyte sedimentation rate (ESR) revealed 19 of 59 subjects above the Jamaican normal range. According to current interpretation, accelerated ESR is a non-specific response to tissue damage, anemia or dysproteinemia. Smokers tended to have slightly lower ESR values than non-smokers. Five non-smokers had high (16–30 mm/hr.) values, while only one smoker fell into this category. This difference did not reach significance.

Table 12. Erythrocyte Sedimentation Rate — Westergren

<table>
<thead>
<tr>
<th>(ESR mm in seconds)</th>
<th>1-6</th>
<th>7-15</th>
<th>16-30</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>20</td>
<td>9</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>(50%)</td>
<td>(69.2%)</td>
<td>(16.7%)</td>
<td>(50.8%)</td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td>20</td>
<td>4</td>
<td>5</td>
<td>29</td>
</tr>
<tr>
<td>(50%)</td>
<td>(30.8%)</td>
<td>(83.3%)</td>
<td>(49.2%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>13</td>
<td>6</td>
<td>59</td>
</tr>
<tr>
<td>(67.8%)</td>
<td>(22.0%)</td>
<td>(10.2%)</td>
<td>(100%)</td>
<td></td>
</tr>
</tbody>
</table>

p = .102
df = 2

Platelets. The range of values for 58 subjects was 74,000–390,000/mm³ of blood. There were 20 cases below the low Jamaican normal value of 150,000/mm³ of blood. A division of the total sample values into thirds shows no significant difference (p > 5) between smokers and non-smokers. Both ESR Westergren and platelet measures are consistent with the white blood count findings. Other differences revealed between groups were (1) lower urea nitrogen levels among non-smokers (p = .041, df = 2) and (2) lower bilirubin levels among the smokers (not statistically significant).

Glucose-6-Phosphate Dehydrogenase enzyme test (G-6-PD). G-6-PD deficiency is a sex-linked, inherent characteristic showing considerable variability among different population groups. It has been reported in 13 percent of United States blacks of West African origin. In Jamaica, a 13.5 percent incidence among rural males was reported in Miall et al. (1967: 53), and 18.1 percent incidence among 11-15-year old males was reported in 1963 by
Roberts, Triger and Morgan (1970). G-6-PD deficiency was found in 12 of the 50 subjects tested in the present study. This was an overall incidence of 24 percent, higher than that previously reported for Jamaica. The incidence was 16 percent among the smokers and 32 percent among the non-smokers.

Table 13. Summary of Glucose-6-Phosphate Dehydrogenase Deficiency

<table>
<thead>
<tr>
<th></th>
<th>Deficient</th>
<th>Non-deficient</th>
<th>Clotted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers (N = 25)</td>
<td>4 (16%)</td>
<td>20 (80%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Non-smokers (N = 25)</td>
<td>8 (32%)</td>
<td>16 (64%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Total</td>
<td>12 (24%)</td>
<td>36 (72%)</td>
<td>2 (4%)</td>
</tr>
</tbody>
</table>

The study shows significant differences between smokers and non-smokers in hemoglobin. Five times as many smokers as non-smokers are in the high range (50–55%) group of PVC values; although not statistically significant, this finding reconfirms the Hb results. Several explanations for this finding are possible, but the only data in the study bearing on these differences are concerned with arterial pO₂ values which were lower in smokers prior to exercise. Although carbonmonoxhemoglobin values were not obtained, elevated carbonmonoxhemoglobin values in smokers would be the most reasonable explanation for the elevated Hb and PCV values noted. In other words, functional hypoxia among smokers has led to increased demand on bone marrow for red cell production.

Given the subjects' pattern of smoking ganja in combination with tobacco, in addition to smoking cigarettes, it would not be possible to determine whether the ganja or tobacco might be responsible for the presumably elevated HbCO values in this sample. Analyses of the statistical data on all the smoking variables presented in Table 14 indicate trends related to smoking per se as a significant factor, as may be seen in the previous section on respiratory function.
Table 14. Body chemistry by smoking indices

(Correlation coefficients between smoking indices and body chemistry)

<table>
<thead>
<tr>
<th>Hematology</th>
<th>Urinalysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure-systolic</td>
<td>Blood hemoglobin</td>
</tr>
<tr>
<td></td>
<td>Monocyte count</td>
</tr>
<tr>
<td></td>
<td>Eosinophil count</td>
</tr>
<tr>
<td></td>
<td>Creatinine</td>
</tr>
<tr>
<td></td>
<td>Bilirubin total</td>
</tr>
<tr>
<td></td>
<td>Albumin</td>
</tr>
<tr>
<td></td>
<td>Serum protein</td>
</tr>
<tr>
<td>Number of tobacco cigarettes per day</td>
<td>.053 .128  .116  .121  -.021  -.071  .184  -.093</td>
</tr>
<tr>
<td>Number of years smoked ganja</td>
<td>-.138 .029  .133  .060  -.458*  .066  .233  -.093</td>
</tr>
<tr>
<td>Daily spliffs</td>
<td>.175  .187  .046  -.071  -.130  .146  .072  -.320</td>
</tr>
<tr>
<td>Daily pipes †</td>
<td>.392*  .339  .441*  .592** .120  -.225  -.072  .399*</td>
</tr>
<tr>
<td>Daily spliffs and pipes</td>
<td>.133  .387*  .342  .342  -.026  -.021  .034  .002</td>
</tr>
<tr>
<td>Cigarettes and ganja combined</td>
<td>.087  .213  -.055  -.055  -.017  -.077  .182  -.088</td>
</tr>
</tbody>
</table>

* Indicates significance at .05 level.
** Indicates significance at .01 level.

† Daily pipe use and clinical findings correlate highly. The method of pipe use – one of deep inhalation, which is not used with the ganja spliff – and the characteristics of the persons who tend to use the pipe more, or exclusively, may account for the strange behavior of this variable.
Chapter VIII

Psychiatry and electroencephalography

Psychiatric examinations

The objectives of the psychiatric assessment were to examine for evidence of psychoses or of detectable abnormalities of mood, thought, behavior or perception and their correlation with ganja smoking; and to examine the relationship of chronic smoking to early parental deprivation, upward or downward mobility, use of other drugs, arrests and convictions.¹

Data were obtained through life histories in narrative form; a General Purpose Psychiatric Questionnaire preceded for computer use (Laska 1968–69); a preceded Mental Status Examination Record (M.S.E.R.), developed by Spitzer and Endicott of New York State Psychiatric Institute; the Eysenck Personality Inventory (EPI, short form) which had been adapted for local use in a previous study; and a ganja smoking history schedule. Family history of mental illness and alcoholism was also explored; a family member whose work and social functioning was reported by the subject to have been disrupted by heavy drinking was recorded as alcoholic.

Findings. Eight of the thirty smokers and two of the 30 non-smokers had positive family histories of mental illness (significant at the .05 level). Seven of the smokers and three non-smokers gave family histories of alcoholism (not statistically significant). Two of the subjects, one smoker and one non-smoker, with family histories of

¹. Subjects were randomly assigned for examination on the second and third days after admission.
mental illness, gave personal histories of past mental illness. The smoker had been hospitalized for a schizophreniform illness, perhaps provoked by heavy *ganja* use. He was one of the subjects reporting auditory and visual hallucinations on first smoking *ganja*.

Four smokers and three non-smokers had had problems with alcoholism in the past, judging on the basis of interference with work and/or social functioning. Two previous studies have suggested that *ganja* may be a "benevolent alternative to alcohol" (Beaubrun 1967; Prince, Greenfield and Marriott 1972). Data from the present study are insufficient to test this hypothesis, given the small number of subjects with histories of drinking problems. However, two of the smokers reported reducing their alcohol intake and related this to smoking *ganja*.

No significant abnormalities emerged from the mental status examinations. Three ratings were obtained from the computerized M.S.E.R.: a Hamilton Rating Scale (H.R.S.) for depression, a Schizophrenic Rating Scale and the Wing Rating Scale for social adjustments. Only one subject, a non-smoker, showed up as significantly depressed on the H.R.S., with a score of 17; he was noticeably depressed, requiring subsequent treatment. Another non-smoker had a Hamilton score of 13 but no significant degree of depression. No one else in the study had a score higher than 9. Neither the Schizophrenic Rating Scale scores nor the Wing Rating Scale scores were indicative of any pathology. The two patients who had given histories of schizophreniform episodes in the past did not show up as abnormal on these ratings.

The Eysenck Personality Inventory (EPI, short form) was administered to investigate extroversion and neuroticism. Extroversion scores for smokers and non-smokers were identical (mean score 3.75). Neuroticism scores gave smokers a mean of 1.8 (out of a possible 6) with a standard deviation of 1.37 while non-smokers had a mean of 2.2 with a standard deviation of 1.88 (not significant).

Ten smokers and two non-smokers reported past hallucinatory experiences (significant at the .01 level). More than half the smokers had this experience only once, on first smoking cannabis. Three of the subjects from a rural area reported a first time visual and auditory hallucination of a "little lady" dancing toward them, an experience which sounded like an initiation rite, as they seemed to feel they were being tested (see Chapter XI).
Since the use of hard drugs is as yet virtually unknown among working-class Jamaicans, it was not surprising to find that no one in the study had ever taken any narcotics, stimulants, hallucinogens, barbiturates or sleeping tablets of any kind. A few had taken an occasional aspirin or a proprietary preparation (Phensic) containing aspirin, phenacetin and caffeine, but these were rarely used. Most had never been to a doctor or taken medication of any kind. The only drugs used other than cannabis were alcohol and tobacco. In every instance ganja use was preceded by cigarette smoking.

Parental deprivation was assessed on a 0–5 scale, taking the following factors into account: presence of parents or parental figures; changes in parental care due to death, emigration, separation, etc.; evidence of poor child-parent relationship, as, for example, frequent beatings, failure to attend school or passing from home to home; evidence of gross material deprivation, such as hunger or lack of clothes. Changes occurring in the first three years of life were rated as greater deprivation than those occurring later. A third psychiatrist reviewed each record independently, without knowledge of the subject's ganja-smoking status. Using these guidelines each subject was allocated to a single category on the 0–5 scale as follows:

0 – constant parental care with good family relationships.
1 – minimal or transitory disturbance or deprivation, e.g., persistent poverty or care by foster parents for a limited period.
2 – deprivation “greater than normal” but with overall satisfactory care.
3 – moderate deprivation, with periods of normal care.
4 – severe deprivation with little consistent care.
5 – severe and persistent deprivation with no period of consistent parental care.

Two other independent ratings were made by a psychiatrist and a non-psychiatric medical practitioner to assess the reliability of the ratings. Exact agreement in ratings was achieved in 79 percent of possible agreements, and agreement within ± 1 occurred in 99 percent of possible agreements. Interobserver reliability was therefore thought to be satisfactory.

Table 1 shows the distribution of deprivation scores among smokers and non-smokers in both groups. If each group is divided
into those with "significant deprivation" (score > 2) and those without (score < 2) it is found that 73 percent of non-smokers, compared with 66 percent of smokers, had no "significant deprivation," which is not significant at the .05 level.

Table 1. Distribution of parental deprivation

<table>
<thead>
<tr>
<th>Parental deprivation rating</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td>8</td>
<td>12</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Non-smokers</td>
<td>11</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>23</td>
<td>5</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>60</td>
</tr>
</tbody>
</table>

The mean deprivation scores, 1.3 and 1.4, in non-smokers and smokers, respectively, also do not differ significantly (Student’s T test).

In view of the frequent reports from the United States that the use of cannabis leads to a loss of competitive striving and an "amotivational syndrome," particular attention was paid to the work record as revealed in the life histories and the General Purpose Psychiatric Questionnaire. Data about regularity and continuity of employment and frequency and nature of job changes were carefully recorded. No significant differences in work record between smokers and non-smokers were found.

There was no significant difference in the number of arrests. Ten smokers and 7 non-smokers had a record of one or more arrests; of these 5 smokers and 2 non-smokers had records of 2 or more arrests. Most of the offenses were minor traffic violations, fighting, wife beating or minor wounding. Five of the smokers (and one control, mistakenly) had been arrested for possession of ganja. The data does not suggest any significant relationship between cannabis and crime (see also Chapter X).

Summary. No significant differences could be demonstrated between the thirty chronic ganja smokers and the thirty non-smokers in the incidence of mental illness or alcoholism, nor of any abnormalities of mood, thought process or behavior. Eight of the smokers and 2 of the non-smokers had mental illness in their family histories. The smokers experienced hallucinations more frequently than the con-
trolls; such hallucinations had usually occurred only once on first smoking ganja. No significant differences were found between the chronic smokers and the non-smoker controls on scales for extraversion and neuroticism measured by an adapted version of the shortened Eysenck Personality Inventory.

No significant differences could be demonstrated in the number of arrests or convictions for crimes; no other drugs were used by either smokers or controls. There was no indication of either upward or downward movement in social or economic position based on occupational data. Finally, no indication of a significant parental deprivation in early childhood was found.

**Electroencephalography**

Electroencephalograms (EEGs) were obtained for all 60 subjects, using the international 10:20 system for the placement of the gold cup electrodes with a Grass Model 6, 16-Channel Electroencephalograph (paper speed 3 cm/sec., high frequency 70 Hz, low frequency 0.3 Hz, sensitivity 10 microvolts/mm). The montages used for each recording were: parasagittal and temporal runs; transverse run, with ECG monitored; reference recording using the tip of nose or chin as reference points. The subjects were hyperventilated for three minutes on the first montage. The majority of the subjects were examined on the first day of admission to the University Hospital.

**Classification of EEGs.** As may be seen in Table 2, the normal EEGs are classified in two groups: unequivocally normal (N) and normal low voltage (LV). The records in which over 80 percent of the predominant activity is below 25 microvolts are classified LV. There are two reasons for characterizing low voltage records as a subcategory. Such records are often found in alcoholics and individuals with anxiety and might be of significance in this study; secondly, certain drugs, including LSD, cause low voltage fast activity (Koren and Mussachio 1968). Several investigators have reported an increase in low voltage fast activity following acute administration of cannabis (U.S. DHEW 1971). The present study did not include acute administration EEG comparisons, but evaluation of low voltage fast activity may be significant in evaluating the chronic
effects of *ganja* (Wikler and Lloyd 1945; Williams *et al.* 1946; Jones and Stone 1970).

Equivocally normal EEGs (E-N), the next category, may be considered normal, but with some suspicious minor focal asymmetries prior to or during hyperventilation (HV). Occasionally minimal excessive diffuse slowing is also included in this group. Some less conservative electroencephalographers might consider these records as minimally abnormal; however, there was no significant difference between the two groups in calculating these equivocal EEGs either way.

Unequivocally abnormal EEGs (Abn) are based on the following criteria:

1. Diffuse (D) slowing with or without paroxysmal activity below seven cycles per second, or alpha below eight cycles per second in an awake adult.
2. Focal (F), or asymmetrical, slowing which persists through the record in either continuous or paroxysmal fashion. Asymmetrical alpha activity is included in this group.
3. Notation should be made as to whether the record is LV.
4. Gradation of abnormalities:
   (a) Minimal (min) abnormality, focal or diffuse slowing from 4–7 cycles per second up to approximately 50 microvolts less than 30 percent with or without occasional paroxysmal activity but with no spokes.
   (b) Moderate (mod), higher voltage slow activity, greater amounts and more persistent with some activity below four cycles per second.
   (c) Marked abnormality is focal or diffuse delta (1–4 cycles per second) or frequent spokes or significant slow alpha. It should be noted that none of the records evaluated in this study was markedly abnormal.
5. Unequivocally abnormal, but only during hyperventilation (R-N HV-Abn). This abbreviation indicates the resting record is normal, but a definite abnormality is present during hyperventilation. These are considered in the unequivocal abnormality group.
Table 2. EEG readings

<table>
<thead>
<tr>
<th>EEG classifications</th>
<th>Smokers</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>N</td>
<td>LV</td>
<td>14</td>
</tr>
<tr>
<td>E-N</td>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>E-N</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>Abn</td>
<td>D (min)</td>
<td>1</td>
</tr>
<tr>
<td>Abn</td>
<td>F (min-mod)</td>
<td>1</td>
</tr>
<tr>
<td>Abn</td>
<td>F (min)</td>
<td>1</td>
</tr>
<tr>
<td>Abn</td>
<td>F (mod)</td>
<td>1</td>
</tr>
<tr>
<td>R-N HV-Abn</td>
<td>F (min)</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td><strong>N = 30</strong></td>
</tr>
</tbody>
</table>

Non-smokers

|          |         | 10               |
|          | LV      | 8               |
| N        | Drowsy  | 1               |
| E-       | D       | 1               |
| E-N      | F       | 2               |
| E-N      | F       | 1               |
| E-N      | F (min) | 1               |
| E-N      | Artifact | 1       |
| R-N HV-Abn | HV-F (min) | 2         |
| N        |         | **N = 30**      |

Legend

N = Normal
LV = Low voltage
E-N = Normal-Equivocal (to be considered)
F = Focal
D = Diffuse
Abn = Abnormal
Min = Minimal
Mod = Moderate
R-N = Resting normal
HV-Abn = Hyperventilation abnormality

Discussion. As can be seen in Table 3, no significant differences appeared between the smokers and non-smokers in definite EEG abnormalities of equivocal cases. Further, most of the findings considered definitely abnormal or equivocal were focal in nature.
Table 3. EEG evaluation

<table>
<thead>
<tr>
<th></th>
<th>Smoker</th>
<th>Non-smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal cases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Low voltage normal</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td><strong>Equivocal cases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focal</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Diffuse</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Artifact</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Normal subtotal</td>
<td>——</td>
<td>25</td>
</tr>
<tr>
<td><strong>Unequivocal abnormal cases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focal</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Diffuse</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Abnormal subtotal</td>
<td>——</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>N = 30</td>
<td>N = 30</td>
</tr>
</tbody>
</table>

It is very unlikely that these were caused by any medication or drug effect. It is extremely rare that medication effects cause persistent focal asymmetries unless there is some underlying focal organic problem, although transient changes may be related to medication effects. The number and type of diffuse changes are not significant (Laguna and Korein 1972; Johnson et al. 1970; Korein et al. 1966; Korein and Maccario 1971).

The comparison of low voltage records in the two groups might be of interest, although the differences are not statistically significant. Further research might attempt the re-evaluation of two groups of records in addition to a double-blind framework, such as that described in a study on chlorpromazine and diphenhydramine (Korein et al. 1971). Further evaluation might also be undertaken by segregating a subgroup of smokers and non-smokers who have no evidence or history of organic cerebral diseases of any type (i.e., head trauma, alcoholism, sickle cell trait, etc.) and comparing EEGs from these groups in greater detail.
Chapter IX

Psychological assessment

The psychological phase of the study was designed to investigate the potential effects of chronic smoking of cannabis on personality and on intellectual and neuropsychological abilities. Since no extensive psychological test battery has been developed or standardized in Jamaica, standardized North American tests sensitive to impairment of brain function were used. These tests are not culture free, but since the primary concern was to determine differences between the smokers and non-smokers, this was not considered a limiting factor, on the assumption that any cultural bias in the test items would be similar and consistent for both groups.

The battery of 19 tests selected included one personality test, three tests of intellectual and verbal abilities and 15 neuropsychological tests. Eleven of the latter were selected from the Halstead (1947) and Reitan (1966) test batteries; the remainder are described by Knights and Watson (1968). Table 1 gives a complete listing of the tests. All tests were administered according to standardized procedures during two sessions on the subjects' third and/or fourth day in the hospital.

Intelligence and verbal abilities

Subtests or test items that were culturally inappropriate, for example, the Information, Vocabulary and Picture arrangement subtests of the Wechsler Adult Intelligence Scale (WAIS), were omitted, since pilot testing demonstrated that the subjects were not generally familiar with the required information. Skills required
by other WAIS subtests were also unfamiliar to the subjects, but it was decided to include them to provide some comparative information about performance.

The Ammons Full-Range Picture Vocabulary was administered to determine vocabulary level. The subject is presented a page with four line drawings, one in each quadrant of the page. He is given a word and asked to point to the drawings which correspond with the word. The test provides tables for conversion of raw scores to IQs. Twenty items from the Reitan (1969) modification of the Walstead Wepman Aphasia Screening Test were also used to examine verbal ability. These items sample the ability of the subjects to name common objects, identify numbers and letters, read, understand instructions, identify body parts and copy designs.

Neuropsychological tests

Tests that have been used to investigate brain-behavior relationships were selected; many of those studies are summarized by Reitan (1966), Klove (1970) and Knights and Moule (1968). Most of the abilities sampled by these tests have been shown to be sensitive to the acute effects of cannabis. Hollister (1971), in his review of the studies, noted significant effects on the following abilities: motor strength, motor speed and coordination, short-term memory, ability to maintain attention and performance of cognitive operations. The tests are classified as simple and complex motor, sensory perception, memory and attention and concept formation.

Motor abilities: The motor tests included a Strength of Grip measure, Finger Tapping, Maze Coordination, Graduated Holes, Pegboard, Tactual Performance. Strength of Grip was measured by a Smedley hand dynamometer. The subject had two trials with each hand, alternating between hands. The Finger Tapping Test measured the optimum finger tapping speed obtained on the best three of four ten-second trials with each hand. The Maze Test requires steadiness during movement. The subject has to move a stylus carefully through a one-quarter-inch channel with several right-angle turns without touching the edge. If the stylus touches the edge, it completes an electric circuit, which then records the frequency and duration of contact.
Table 1

<table>
<thead>
<tr>
<th>Tests</th>
<th>Number of variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence and verbal abilities</td>
<td></td>
</tr>
<tr>
<td>1. Wechsler Adult Intelligence Scale (8 subtests, 3 IQ scores)</td>
<td>11</td>
</tr>
<tr>
<td>2. Ammons Full-Range Picture Vocabulary Test</td>
<td>1</td>
</tr>
<tr>
<td>3. Selected items from Reitan modification of Aphasia Screening (total correct)</td>
<td>1</td>
</tr>
<tr>
<td>Neuropsychological tests</td>
<td></td>
</tr>
<tr>
<td>a. Single and complex motor functions (right and left)</td>
<td></td>
</tr>
<tr>
<td>4. Dynamometer</td>
<td>2</td>
</tr>
<tr>
<td>5. Finger tapping</td>
<td>2</td>
</tr>
<tr>
<td>6. Maze steadiness (timer and counter)</td>
<td>4</td>
</tr>
<tr>
<td>7. Graduated holes (timer and counter)</td>
<td>4</td>
</tr>
<tr>
<td>8. Pegboard</td>
<td>2</td>
</tr>
<tr>
<td>9. Tactual Performance Test (TPT) total</td>
<td>1</td>
</tr>
<tr>
<td>b. Sensory perception (right and left)</td>
<td></td>
</tr>
<tr>
<td>10. Tactile stimulation</td>
<td>2</td>
</tr>
<tr>
<td>11. Auditory stimulation</td>
<td>2</td>
</tr>
<tr>
<td>12. Tactile form recognition</td>
<td>2</td>
</tr>
<tr>
<td>13. Finger-tip writing recognition</td>
<td>2</td>
</tr>
<tr>
<td>c. Memory and attention</td>
<td></td>
</tr>
<tr>
<td>14. Tactual performance tests: Memory</td>
<td>1</td>
</tr>
<tr>
<td>15. Tactual performance tests: Location</td>
<td>1</td>
</tr>
<tr>
<td>16. Time-sense-memory</td>
<td>1</td>
</tr>
<tr>
<td>17. Seashore rhythm</td>
<td>1</td>
</tr>
<tr>
<td>d. Concept formation</td>
<td></td>
</tr>
<tr>
<td>18. Indiana-Reitan Category Test total</td>
<td>1</td>
</tr>
<tr>
<td>Personality</td>
<td></td>
</tr>
<tr>
<td>19. Lowenfeld Mosaic Test</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

The Graduated Holes Test measures motor steadiness without movement. The apparatus is a metal plate with nine holes of graduated size. The subject inserts the stylus in each of the holes for a ten-second period, trying not to touch the edge. The largest hole is one-half an inch in diameter, the smallest, one-sixteenth of an inch; the number and duration of contacts are recorded. The Pegboard Test measures fine motor coordination and speed. The four-inch square board has twenty-five key-holes, the subject is required to place uniform pegs into all the holes as rapidly as possible and the score is determined by the length of completion time. The Tactual Performance Test, considered the most complex motor task, consists of a six-hole Sequin-Goddard formboard. The subject is
blindfolded before the test begins and is requested to place blocks into their proper spaces on the board as quickly as possible. He performs the task first with his dominant hand, then his non-dominant hand, and then with both hands. The total time taken for the three trials is recorded.

Sensory perception: These tests included tactile and auditory stimulation, tactile forms and finger-tip writing recognition. The Tactile Stimulation Test requires the subject to perceive accurately when he has been touched on the back of each of his hands either unilaterally or bilaterally. For the Auditory Stimulation Test, he is asked to indicate unilateral or bilateral sounds made by the examiner with the finger tips next to his ear. Tactile form recognition requires the subject to identify each of four common plexiglass shapes by manipulation; and finger-tip writing requires the recognition of one of four numbers written with a pencil on each of the finger tips. None of these four tests permits the use of visual cues.

Memory and attention: The tests in this group included the Memory and Location scores of the Tactual Performance Tests, the Time-Sense-Memory Test and the Seashore Rhythm Test. The Memory and Location scores are obtained by asking the subject to draw from memory the plexiglass shapes he felt on completion of his performance of the Tactile Form Recognition Test. He is scored for the number of shapes he accurately reproduces and for correct location on the page. Since the subject never sees the blocks these two tasks require the subjects to remember on the basis of touch alone. The Time-Sense-Memory Test requires the subject to depress a key that allows a sweep hand of a clock to rotate. His task is to permit the hand to rotate ten times and then stop it as close to the starting position as possible. The score is the total error time in seconds for 40 trials. The Rhythm subtest of the Seashore Test requires the subject to discriminate between 30 pairs of rhythmic beats which are either the same or different.

Concept formation: The Category Test, selected from the Reitan-Indiana Neuropsychological Test Battery (Reitan 1969), is normally used for children from five to eight years of age but was
administered in the absence of other suitable standardized tests in order to obtain a measure of concept formation ability. The subject is to figure out the principle in each of five subsets of a series of 80 slides. The principles used are those of color, number, uniqueness, area and memory. The subject is given feedback by either a bell or buzzer to indicate whether he is correct or incorrect. He can use this information to modify his responses.

**Personality test**

The Lowenfeld Mosaic Test was selected to include a "culture-free" projective psychological test in the battery of perceptual, motor skill and intelligence tests administered. The Lowenfeld is a non-verbal test that allows a good deal of freedom of choice in carrying out the task and is not subject to the pressure of time, since there is no time limit, and evaluation of results is not based on "correct" or "incorrect" performance.

The Lowenfeld Mosaic Test uses 456 small wooden squares, diamonds and triangles of various colors and sizes. The subject is instructed to make anything he likes with the pieces. Normally, the patterns are classified as representational, conceptual or abstract in design and are then analyzed as multiform, composite, diffuse and collective. Frequency counts of the variables of number, color, shape, area, organization and time were used in the analysis.

**Results**

The 19 psychological tests included measures on a total of 47 subtest variables, listed in Table 1. The scores on each of these variables for the smoker and non-smoker groups were compared with the t-test statistic. For the purpose of analysis, the subjects were also divided into three categories of smoker, occasional smoker and non-smoker with 28, 9 and 23 men in each group respectively. The data from the three groups were analyzed by F-Tests and Chi-square Tests.

The 47 analyses of variance tests of the three groups yielded four
statistically significant results. The WAIS Digit Span performance of the smoker group was highest ($F = 3.21; \text{df} = 2.57; p < .05$); the number of edge contacts on the Holes Test with the non-dominant hand was greatest for the occasional smoker ($F = 4.16; \text{df} = 2.56; p < .02$); and the choice of a triangle shape on the Mosaic Test was more frequently made by the occasional smoker group ($F = 5.83; \text{df} = 2.56; p < .01$). The only significant Chi-square result was on the number of edge contacts on the Holes Test for the dominant hand ($x^2 = 9.97; \text{df} = 4; p < .05$). In this case the non-smoker group had the best performance and the smoker group the poorest. Chi-square tests were calculated by dividing the test scores into thirds and constructing a $3 \times 3$ table for each of the 47 variables.

In an attempt to determine whether there was a general trend for one group to perform better than the other, the mean scores on all of the variables were calculated and a record kept of which group scored better on each of the 47 variables. In terms of frequency, the smoker group scored better on 29 and the non-smoker group scored better on 18 of the 47 variables.

In view of the absence of consistent group differences, it was important to consider whether the subjects performed consistently or reliably during the period of test administration. This may be done by examining the pattern of correlation coefficients between and within various tests in the battery as compared to similar correlations in North American samples. This is not a comparison of the level of performance but of the pattern of test relationships. Table 2 presents inter-test correlation coefficients among the three IQ measures – the Category Test; the Tactile Performance Test; time, memory and location; the Seashore Rhythm Test; the Tapping Test; and the Time-Sense-Memory Test – for the present study as well as coefficients from a study by Reitan (1956) of adults without cerebral lesions. There is an overall similarity in both the size and pattern of relationship.

The inter-test correlation coefficients of the WAIS subtests were also compared with the subtest intercorrelations presented in the WAIS manual for ages 25 to 34. (The average age in the present study was 36.6 years.) Again the size of the coefficients and the general pattern is quite similar:

Another method of making intra-test comparisons is to examine
Table 2. *Inter-test correlations*.

<table>
<thead>
<tr>
<th>Tests</th>
<th>1) Full Scale IQ</th>
<th>2) Category</th>
<th>3) TPT-Time</th>
<th>4) TPT-Memory</th>
<th>5) TPT-Location</th>
<th>6) Seashore</th>
<th>7) Tapping</th>
<th>8) Time-sense</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- .54 (- .72)</td>
<td>- .40 (- .36)</td>
<td>.36 (.36)</td>
<td>.52 (.48)</td>
<td>-.52 (-.29)</td>
<td>.23 (-.32)</td>
<td>.56 (.39)</td>
<td>-.53 (-.50)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.57 (-.40)</td>
<td>-.33 (-.26)</td>
<td></td>
<td>.42 (.27)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.39 (.28)</td>
<td>.39 (.28)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.05 (-.42)</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.27 (-.33)</td>
</tr>
<tr>
<td></td>
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<td>.15 (.42)</td>
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<td>-.22 (-.25)</td>
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<td></td>
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<td>-.10 (-.18)</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>.09 (.26)</td>
</tr>
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<td></td>
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<td>.29 (.04)</td>
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<td></td>
<td>-.27 (.13)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.24 (-.24)</td>
</tr>
</tbody>
</table>

* Correlations in parentheses are from Reitan (1956).
the relationship of the performance on two sides of the body as measured on the motor tests. The correlation coefficients of the right and left hand performance on the six motor tests in the present study ranged from .45 to .91, while on the same tests administered in Canada the coefficients ranged from .47 to .89 (Knights and Moule 1968).

In-depth analysis of the subjects' performances in the Lowenfeld Mosaic Test revealed that smokers selected more colors than did controls (statistically significant); that several smokers were more vocal than controls, commenting and talking to themselves during the testing (not significant statistically, but a strong tendency); and that a few more controls than smokers successfully completed their designs (not significant statistically, but a definite tendency). Judging from the results of this test, the smokers, as a group, seemed to be more open in their expression of feelings, somewhat more carefree and somewhat more distractible than the controls. There is no evidence of organic brain damage or schizophrenia among the subjects, based on the results of the Lowenfeld Mosaic Test.

Discussion

The comparisons of psychological test results between groups of cannabis smokers and non-smokers indicate no consistent differences; the few statistically significant differences found are considered chance findings. The data clearly indicate that long-term cannabis use by these men did not produce demonstrable intellectual or ability deficits when they were without the drug for three days nor is there evidence to suggest schizophrenia or permanent brain damage.

These findings are comparable to the results of a psychological study carried out independently in Jamaica in 1971 by Marilyn Bowman (1972). Bowman's sample consisted of 26 matched male subjects – 16 heavy smokers of ganja and 10 controls from the north coast. History of ganja use ranged from six to 31 years, with a mean of 16.6 years. Age at first use ranged from nine to 21 years, with a mean of 12.5 years. Subjects smoked both spliffs and pipes and took ganja extensively as a medication (1972: 49).²

² Three samples of ganja analyzed by the Canadian Food and Drug Directorate ranged in Delta-9-THC content from 2.66 to 13.64%, values considerably in
The battery of tests used in Bowman's study included measures of physiological, sensory and perceptual-motor performance, tests of concept formation, abstracting ability and cognitive style and tests of memory. No impairment was demonstrated on any of these measures. The study was then replicated with a sample of 28 matched subjects, 14 smokers and 14 controls. Bowman reports that "the replication study confirmed the results of the original study strongly and consistently" (1972: 121).

Bowman made the following conclusions: "The temporary alterations of sensory and perceptual-motor skills commonly found when a user is under the immediate influence of the drug, do not appear to create any comparable permanent changes with chronic use. Similarly, the impairment on concept formation tasks known to be associated with intoxication by the drug, and with slow degenerative brain processes initiated by other drugs such as cocaine and alcohol, does not appear to create any comparable changes in chronic marijuana users. Finally, the disruptions of memory associated with heavy chronic alcohol use and with acute marijuana intoxication, are shown not to lead to any significant chronic memory disruptions in heavy regular users of marijuana" (1972: 103). The results of the psychological studies of the Jamaica Project confirm Bowman's finding that in a wide variety of human abilities, there is no evidence that long-term use of cannabis is related to chronic impairment.

excess of the 4-5%, Delta-9-THC content reported by Mechoulam (1970) as typical of hashish. See Appendix VI for estimated THC content of cannabis used in the U.S., Greece, Egypt, Morocco, India and Jamaica (McGlothin 1974).
Attitudes and reactions to ganja

While clinical examinations of acute effects of *ganja* smoking were not undertaken at the University Hospital because of legal restrictions, subjects were questioned at length about the immediate effects of *ganja* smoking, in terms of their perceived symptoms and reactions. All smokers and controls who reported a *ganja* smoking experience were asked a list of questions based on the range of acute *ganja* reactions reported in the literature (U.S. DHEW 1971: 67). The questions and responses about initial and subsequent reactions are presented in Appendix VII.

The interviews were carefully conducted to make sure that the subjects understood the questions; local terms were substituted for culture-bound terms like “aggression,” “hallucinations” or “visions”; and considerable probing was done to ascertain that the subjects’ responses were correctly understood. Since working-class Jamaican smokers are oriented to pragmatic rather than to “psychedelic” reactions, it was difficult to elicit descriptions of a “high” or to explain in cross-culturally meaningful terms the distortion of time, perception, memory or sight and sound that have been reported in the United States. A great deal of time was devoted to these discussions with the subjects, who would themselves query the interviewer, if they were uncertain about the meaning of the question.

All subjects, both smokers and those controls who had had an initial trial, clearly recalled the circumstances of their first *ganja* smoking experience, their expectations and reactions, and the approximate quantity smoked, whether a few draws or a full spliff. Recall of the initial experience was clear with a few exceptions
despite the length of time that had elapsed for older subjects. Regular smokers were asked the same series of questions about their subsequent experiences, to probe for similarities and differences in subjective reactions once they had become chronic smokers. This second series of questions elicited considerably more discussion than the first, as the subjects were concerned about clarifying the factors in each situation that they considered pertinent in conditioning their reactions. They also wanted to differentiate between reactions to taking ganja tea and smoking.

Again, subjects responded as well as they could, in view of the essentially alien concepts presented to them in some questions. Generally they were perceptive in stating that they were not certain their reactions could be directly attributed to ganja: "Sometimes when I smoke, I don’t know if it is through the smoking or what, sometimes the time may [seem] short and sometimes the time [seems] longer. But I never really check on it to know if it is really herbs." When asked if ganja made him feel sociable, one subject replied, "Me social from me born." Questioned as to whether ganja induces meditation, another responded, "Me meditate without me use it." Another subject, struggling with the concept of "visions" asked the interviewer, "You mean duddy and thing? [Duppy are omnipresent ghosts in Jamaican folklore.] Me see ghosts whether me smoke or not," that is, it is not the ganja. A subject who was asked, "Does it make you feel like talking?" replied, "I am not a man who talks much." The subjects were careful in considering their responses and clarifying the nature of their reactions.

Ganja use as a situational syndrome

In addition to the specific range of questions related to acute symptoms, the life history interviews probed for reasons of use or non-use, attitudes about use or non-use, beliefs about the attributes of ganja and behavior ascribed to its use: The semi-structured interviews allowed the subjects to express freely their perceptions of their own and observed reactions. Smokers reported subjective experiences at length and non-smokers were queried about their observations and their attitudes about the use of ganja.

The extensive life history and community study data strongly indicate that the use of ganja by lower-class Jamaicans is a situational
syndrome, selectively taken for specific purposes. Reasons for use of ganja and reactions to ganja are situationally determined by perceived needs, whether for health, hunger/appetite, meditation, relaxation or problem solving.

The subjects generalized about reactions they observed among others, as well as their own, in terms of situational responses: It makes people sleepy when they want to rest, knowing they will wake up invigorated to work; it makes you feel happy, when it’s time for it; if you have a problem, ganja helps you solve it; it helps you concentrate on what needs to be done and you can do it with a “willing and cheerful spirit”; if you’re working, it gives you the vigor to work, and so on.

The subjects also stressed situational determinants in response to queries about the effect of ganja on appetite: It makes you hungry “when you smoke it on hungry belly.” Sometimes it “makes you feel like eating,” sometimes not; if you take it before eating it helps you enjoy your meal, but if you have a “piece of work” to do, it makes you “forget food”; ganja may “open” the appetite, particularly before meals, but none of the smokers reported the ravenous hunger cited in the literature. ¹

The subjects’ opinions about the alleged aphrodisiac qualities of ganja were also either situational or idiosyncratic: “It makes you feel sexish if you do it for that reason.” As one subject put it: “It makes you feel sexy when you want sex, not if your mind [is] not on sex,” while another maintained that “the weed can’t make me sexy.” Instant aphrodisiac effects were never reported and tended to be dismissed. None of the working-class subjects reported the “wolfish” reactions mentioned by several middle-class Jamaicans, and several regular smokers reported occasional periods of abstinence from sex.

The United States National Commission on Marihuana and Drug Abuse review of medical and clinical observations on the effects of hemp drugs on sexual arousal points out: “Perhaps the most conclusive and consistent finding to emerge from the studies of the effects of marihuana on psychosexual stimulation is that the degree of sexual interest, desire and arousal induced by marihuana

¹ The (United States) National Commission (1972, v. I: 34) review of research on blood sugar and food intake reports: “No consistent significant change in blood sugar has been demonstrated... some investigators finding decreases... still others finding both increases and decreases.”
is dependent on the characteristics of the user and the extent to which he comes to expect or anticipate such effect” (National Commission 1972, v. I: 435). It has been alleged in a 1968 article by Mann that “chronic intoxication with hemp narcotics soon leads to loss of potency and often ends in sexual inversion” (cited in Bowman 1972: 117). No such problems were noted in the clinical studies or reported by subjects in the sample; apparently in the sexual realm as in other areas, expectancy effects are paramount. The National Commission report further asserts that “there is nothing inherent in the drug itself which produces heightened sexual interest, desire or arousal, nor is there any physiological evidence to show that marihuana directly or specifically acts on either the sexual centers of the brain or the sexual organs” (v. I: 436). The findings of the intensive interviews in the Jamaica Project attest to the fact that cultural and social class differences in attitudes to sex and sexual relations as well as subjective states account for the differences in the reported “instant aphrodisiac” or alleged “loss of potency” effects of marihuana. Moreover, no differences in libido between smokers and controls were found on medical examinations: two smokers had reduced libido and one control absence of libido; the rest were found normal.

Problem solving

Subjects claimed that ganja “brainifies” you, a claim generally made in relation to learning, particularly for schoolboys. One subject, a skilled worker, stated: “If it wasn’t for it, I wouldn’t be where I am. I wouldn’t be able to learn a trade. I wouldn’t be able to read and write for my school days was short.” Although such strong assertion is rather atypical, smoking ganja is frequently cited as a means to problem solving.

Plenty times I have a problem on my job like the engineer ask you to do something and you don’t know how to build it. And when you go home and take a spliff the thing just comes to you plain.

A cabinet maker and construction worker who smoked over five spliffs a day reported:
When I have a problem, like designing a piece of woodwork or doing [construction] work, I smoke very hard.

Occasionally, when probed about “visions,” subjects, replied in terms of finding solutions to problems, as in the following response to the question “Does it make you see anything special?”

Like seeing truth and facts? Yes, that’s why I tell you I can depend on it if I have a problem at work. When I go home I just build a spliff and lie down and see the truth. Then when I go back [to work] the next morning I work it out.

The cultural definition of “seeing things” here is clearly pragmatic.

**Motivation**

The major reason given for ganja use is the perceived stimulus to energy and work motivation. Typical responses are related to the work drive as in the following: “I get a stronger sensation toward my work, more than when I don’t have it.” “If I’m going to do any work it gives me the spirit to do it and stay until I finish.” It makes you “feel stronger,” “work harder and quicker” and “work faithfully right to the end.” Some people “can’t work if they don’t smoke it, they fret about their work, but if they have ‘a stick,’ they don’t consider the work hard and it makes them work very good.” One respondent claimed that it makes him work “like holy hell.”

Non-smokers also attested to increased work drive among regular smokers: “I have seen people who want to attack a certain amount of work – manual labor – and they attack it better than if they hadn’t smoked at all. It gives you a kind of boost.” Cultivators who are non-smokers customarily provide ganja for smokers in cooperative field work groups: “After they smoke it and they decide to work you have to come out of their way, they don’t stop work. They can’t tire, you get more work out of them.” The purchase of ganja for this purpose is considered an investment in labor productivity, on sugar estates as well as on small farms.

Apart from the perceived stimulus to manual labor universally reported, it was important to determine the effect of chronic use of ganja on employment history. As noted in Appendix VI, all but two of the smoker subjects were employed at the time of the study; two
were doing odd jobs and two were ganja dealers; none of the controls fell into these categories. Nineteen smokers and 13 controls (of 26 controls who provided data) reported having been unemployed in the past. Smokers and controls had similar reasons for job changes: they found a better job; the job was terminated; they couldn't get along with co-workers; health and family reasons. Nine subjects, 4 smokers and 5 controls, reported having been fired at some time in the past. The differences between smokers and controls on employment history are not statistically significant.

There were also no significant differences between smokers and controls on the nature of savings or when possible the desire to save. Judging from this data, chronic use of ganja did not change the course of employment history characteristic of semi-skilled workers in Jamaica.

Medicinal uses

Curative and prophylactic properties are commonly accepted attributes of ganja, by non-smokers and smokers alike, and by women as well as men in the working class. Medicinal use of ganja is common in the countryside and fits readily into the folk pharmacopoeia of bush teas, liniments, poultices and the like. One subject claimed that "even the water from [his] pipe" was a healthful tonic.

The question of therapeutic use of ganja generally elicited a range of enthusiastic responses, particularly from smokers in the sample: "It was made for the healing of all nations." Smokers were eager to assert the prophylactic properties of ganja — "people who give their hearts to 'herbs' don't get sick" — and to claim that it keeps them in good health. A group of heavy smokers in one of the communities gave emphatic assurances that use of ganja had spared them from a recent epidemic of influenza. A number of smokers noted that the first time they had ever been to a doctor was when

2. The Canadian Commission notes the past and current illegal use of cannabis in North America "to reduce the secondary symptoms and suffering caused by the flu and the common cold." It is suggested that these effects "may be a function of the drug's reported ability to improve mood, reduce pain and perhaps lower fever," and that the general medical potential of cannabis may be determined by ongoing research (Canada 1972: 32–33).
they came to the University Hospital to be examined for the project. The majority of the controls also agreed to the therapeutic value of ganja tea, although one control took a dim view of the universally alleged benefits: “If it could cure sickness nobody would be sick because everybody would be cured.” Folk belief in the therapeutic effects of ganja is very widespread, and ganja tea and tonic are taken for a variety of ailments regardless of attitudes toward smoking. Fifty-three subjects in the sample (88 percent) reported that they used or had used ganja in some form for medicinal purposes. Folk beliefs undoubtedly bolster the therapeutic effects; as one smoker cogently observed, “It’s belief kill and belief cure.”

The law

Legal sanctions against smoking and cultivating ganja are necessarily a serious concern to both smokers and cultivators. The law may serve as a deterrent to ganja smoking and cultivation for the nonsmoker. Although regular smokers are not deterred by legislative sanctions, they are very much aware of the risks involved from police and potential informers in the community. Smoking sets and settings, cultivation activities and distribution networks are organized to circumvent the possibility of arrests and penalties. Questions relating to views of the anti-ganja legislation elicited considerable discussion among the subjects. The replies fell into positive, negative and ambivalent categories, although not necessarily on the basis of the smoker/non-smoker dichotomy.

Positive responses, that is, those in favor of the anti-ganja legislation, were frequently motivated by economic considerations:

Well I'm not against them [the police] for when I have a little stuff to sell, it would be hard to sell if they free it up.

Other positive responses were based on moral and doctrinal considerations:

The law is for the lawless, we must stamp out evil. Our religion strictly prohibits encounter with those drugs or alcohol or coffee and certain fish and the pig.

For adamant non-smokers, church sanctions reinforce the legislative sanctions:
If you are a Christian [member of a Pentacostal sect] you don't use it. You can draw it for tea but there is a danger in smoking it.

Respect and/or fear of the law and also "scientific" knowledge available to the government were deterrent factors in some responses:

They [the government] are at the head so they know what we don't know and they say they're against it so they must know. They must know what they're doing, for they're planning for us. I don't like to get involved with the police. From the time I was growing up and realized that the slightest thing can be trouble I don't get in trouble.

Negative attitudes toward ganja legislation fell into several categories: general feelings about discriminatory practices against the working-class, comparison with lack of prohibition against alcohol, and deprivation of the perceived benefits of ganja. The most frequent responses in opposition to the legislation reflected general feelings of government discrimination against the working class – the government is against "herbs" because there's something good in it; it would take money away from doctors (a frequent judgment); it would put the cigarette manufacturers out of business; government wants "to keep the people down," it doesn't "want the people to get ahead"; "the rich man can plant ten acres and nothing happens to him; but the poor man gets jail." "It must be good if it's illegal," was an often-expressed commentary. The perceived energy-giving, medicinal and psychological benefits of ganja were frequently cited as reasons why the legislation should be changed. Some subjects felt that rum rather than ganja should be prohibited on the basis of its deleterious effects on the individual and the community.

Ambivalent replies on anti-ganja legislation and enforcement generally fell into two categories: there should be special consideration for the privacy of ganja use, and qualifications in the law should be made in terms of "individual capacity." While some subjects accepted the fact that the government can "form what laws they want," they felt that it should not "interfere with a man" who goes to a "hiding place" to smoke. Others pointed out that the law is "good for some people and bad for some," in terms of
perceived idiosyncratic differences in reactions to ganja. They proposed that the legislation should take this into consideration: “Only if it can be proven that if a person smokes it, it can make him do anything bad, that person should be punished by law.” Some suggested that the government should “test the man” and “if the man can control it, free him, but if the man can’t control it, put a stoppage to him using it.” The controls were more inclined to approve anti-ganja legislation than were the smokers (significant at .001) and less inclined to suggest special amendments to the law based on individual “capacity” or privacy of use.

**Social pathology**

During the life history interviews, subjects were questioned about their views of the relationship of ganja to crime, violence and insanity. The majority of the replies stress the predisposition of the user, rather than ganja, as the causative factor in antisocial behavior:

Anything a man does, he was going to do before he smoked ganja; if you’re damn wicked underneath, it will come out.

Similar views are held about the alleged correlation between ganja and insanity:

That can’t happen, a man who is mad had “mad” in him before he took ganja.

These responses are independent folk paraphrases of current scientific conclusions about the alleged links between marihuana and antisocial behavior or pathology still occasionally reported in the literature. Several subjects, including controls, noted that ganja may provide a “boost,” but that personality predisposition is the essential variable. In the words of a control subject:

I don’t see it make anybody do anything out of order unless you had the intention before. It is a boosting thing.

Smokers tended to discuss questions about antisocial behavior at greater length, but the point is essentially the same: “The man who says he smokes herbs to commit crimes is wrong; he might take it as a boost, but it wasn’t herbs that sent him to the act – he planned it already.” Allegations of direct ganja-madness-violence links are
disputed by regular smokers, generally on the basis of personal experience:

One man says, mind you smoke herbs and it mad you. I say, no man, when I smoke the herbs I feel good.

Dem say it mad people, makes men kill men and all kind of things. I don’t believe that. Anything that don’t hurt one man not supposed to hurt the next man.

People say it will mad you. I never believe it will mad nobody because I use it every day and it don’t do me nothing.

It makes me feel all right. It makes me feel good, makes me think on God and meditate. Doesn’t make me go on like a “rude” boy. It makes me quiet.

Ganja and crime

The majority of the subjects – smokers and non-smokers – asserted that there is no correlation between ganja and crime and that criminal behavior depends on individual predisposition. Only five subjects felt there is a correlation between crime and ganja use, and one of these (a smoker) maintained that ganja decreases criminal activity. In terms of actual “criminal activity,” twenty-eight of the subjects had a record of charges ranging from traffic violations, “abusive language” (a strictly enforced regulation in Jamaica) and fighting, to possession of ganja. Five smokers had been arrested for possession of ganja, and one control had been mistakenly arrested for the same charge. There were no differences between smokers and controls in total number of charges. However, six controls as opposed to three of the smokers had been charged with crimes of violence. Apart from the ganja charges then, smokers were less prone to “criminal activity,” in terms of the nature of the charges, than the controls.

The legislative debates on ganja, frequently reported in the local press, exacerbated such stereotypic concepts as “the immediate effects [of ganja] induced violent psychosis and violent reactions.” The subjects were well aware of the negative stereotypes surrounding ganja smoking, as opposed to its medicinal use in teas and tonics. Having accepted and adapted to the social stigma attached to smoking, they had evidently considered the potential “effects” of becoming a regular smoker and come up with the rationale either
that if it doesn’t harm them, it should harm no man, or that they
“have the head for it,” and consequently could suffer no negative
effects. Despite the negative official attitudes, however, smokers,
generally, believe the worst “effect” of smoking ganja is “getting
cought.”

The United States Department of Health, Education, and
Welfare report of 1972 points out: “The acute effects of marihuana
intoxication vary considerably due to several factors which can be
classified as related to the marihuana itself, the dose and route of
administration, the individual’s rate of metabolism, his past ex-
periences concerning the drug, his expectations, as well as the
environmental and social setting in which the intoxication takes
place” (U.S. DHEW 1972: 200). The subjects’ reports confirm the
role of past experience, expectations and situational factors in
conditioning acute reactions as well as the objective finding that
“ganja does not per se induce aggressive or criminal activities”
(Murphy 1963: 16).

Dependency

One of the conditions for the participation of smokers in the
project was abstention from the use of ganja while they were in the
hospital, in accordance with the agreement made with the Univer-
sity administration. As previously noted, all but one of the smokers
observed this condition. The injunction against smoking at the
hospital provided ward and psychiatric staff opportunity to observe
withdrawal symptoms. A few of the heavy smokers appeared
fidgety—there was also the problem for a number of subjects, both
smokers and controls, of adjustment to the hospital environment,
homesickness, the change of diet and the discomfort of some of the
physical examinations—but no withdrawal symptoms were observed.

The question of drug dependency—“typically a physical or
psychological inability to function or be comfortable without regular
drug taking” (Blum 1971: 91)—has received much attention in the
literature on cannabis. Smokers in the United States say they “can
take it or leave it,” and this fits in with the comparatively short
duration of their “pothead” life style (Grinspoon 1971: 209, 235).
In the Jamaican situation where the period of ganja smoking extends
much longer—probably into sociologically defined “old age,”
unless other factors intervene – it is more difficult to isolate the variable of “dependency” from that of habit and culturally conditioned life style. The U.S. Department of Health, Education and Welfare analysis of the literature pointed out that “reports based on Indian experiences suggest neither severe physical or psychic dependence nor severe withdrawal symptoms even after abrupt termination of very heavy usage” (U.S. DHEW 1971: 70). Similar findings were reported by the National Commission on Marihuana and Drug Abuse (1972). These findings are borne out by the project experience.

The U.S. Department of Health, Education and Welfare report also notes that “psychic dependence may, however, be an important obstacle to discontinuing cannabis” (1971: 71). Life history interviews revealed symptoms of what may be termed “psychic dependency” among several heavy users:

If I don’t get a draw in the morning I can’t feel good. It comes like a man who’s used to his rum.  
When I get up and I use it I feel fresh in myself. If I don’t get it, I just torment in myself.

One of the heaviest users reported:

You can give me a spliff every 15 minutes. I feel dead if I don’t get a smoke.

Other comments about continuity and discontinuity of ganja smoking elicited in the life history interviews followed the same pattern of “psychic dependency”:

I can’t do without my smoke.  
I love it. I am like a fish out of water [when none is available].  
If I can’t get the weed to smoke I drink rum hard.  
Since I started [smoking], this is the week I stand off most [while at University Hospital].  
I really wouldn’t like anyone to tell me not to smoke my herbs.  
It costs me more than food, I take it hard.  
When I don’t take a draw I feel out of myself.  
When I take a draw I feel better than when a man takes a drink.

When discontinuity is necessary, however, usually for economic reasons, it is faced philosophically:
When you don't have money you don't buy it. Sometimes you can't get it and you don't worry about it. I love it you know [but] I can't consider myself a hard drawer for I don't have the money to buy it. It never shows this man no danger. And when I don't get a draw I just sit down and don't molest nobody.

In retrospective reports it is difficult to calculate systematically the periods of discontinuity (for economic or other reasons) in the life histories of regular smokers. Some subjects may estimate the cost factors fairly accurately, but this does not provide information about periods of abstinence or withdrawal symptoms:

In those days I used to draw harder than now [about 1 oz. a day]. I don't use so much now, I can't afford more than 4 sticks a day.

A number of subjects indicated that they had periodically discontinued smoking, whether for economic or cautionary/legal reasons. One heavy user reported considerable discomfort on the first day he discontinued smoking but said he was "feeling fine" by the third day. Retrospective data in this regard, however, is not sufficiently clear to establish levels of dependency.\(^3\)

The question of tolerance, that is, the need to increase quantities, with repeated frequent use, in order to produce the same effects, could not be systematically analyzed, even though duration of smoking was established. In a retrospective study of the history of chronic smoking, for periods ranging from seven to thirty-seven years, it is not possible to establish firm baselines for exact quantities, frequency and/or the potency of grades of cannabis smoked over time. Also, given the early age of the first experience and the time lag before the onset of chronic smoking, the levels of regular smoking would be conditioned by economic factors and age of

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3. No "abstinence syndrome" was found in several studies of the clinical effects of the subacute administration of marihuana to man. In one of the studies (Volavka et al. 1971), dysphoric effects lasting five days were noted in two subjects who were detoxified heroin addicts. In all studies, including the latter, "No abstinence syndrome or physical dependence was observed after abrupt termination of smoking [marihuana]" (National Commission, v. 1, 1972: 41, 42).
entrance into the labor force. Carefully controlled longitudinal studies (including periodic reporting and/or note-keeping by subjects) as well as regular assays of cannabis samples and of THC metabolites would be required to determine the phenomena of "tolerance" or of "reverse tolerance," the reduction of dosage required to produce similar effects.

The attitudes and reactions to ganja of the subjects in the sample conform with those of the larger population, as reported in Chapters IV and V, lending further support to the extensiveness of the ganja complex in the working class.
Chapter XI

Cultural expectations and predisposition to ganja

Sociopsychological factors

In Jamaica, with a high frequency of ganja use in the working class, socialization to becoming a smoker is undoubtedly a more pervasive process than it is in the United States. While the novice in the United States must become acculturated to the marihuana subculture (Goode 1970), the Jamaican user more likely has been enculturated by observation and exposure since early childhood and is preconditioned to its use. Consequently, in terms of initial reactions, the process of ganja socialization in Jamaica reveals interesting differences between smokers and non-smokers. Generally neither instructions about the method of smoking to the Jamaican initiate by his peer group nor precepts about possible reactions are provided. Such knowledge is gleaned at an early age in the community setting. The rare working-class individual could claim to have been unaware of ganja use as a child.

The nature of his reactions to the first ganja experience may determine whether or not the initiate becomes a regular smoker. In contrast to recall of the first alcoholic drink1 this first smoking experience is universally remembered. The onset of regular use may be marked by an initial vision or other positive experience: “It sweet me” is a common recollection. A confirmed smoker apparently acquires confidence long before his first experience, and the positive

1. Yawney, for example, notes that only a few of the subjects in a study of drinking in Trinidad remembered the circumstances of their first drink (Yawney 1968).
initial reaction reinforces his peer-group status as a smoker. However, not every initiate has a positive first experience. A negative experience, though not necessarily the severe "panic reaction" described in psychiatric case literature, permits deviance from the ganja smoking subculture.

Just as culturally recognized signs mark the onset of regular smoking, equally valid cultural cues allow one not to become a regular smoker and at the same time resolve the dilemma of deviance for the individual and the group. Deviation from the ganja smoking subculture may stem from a variety of psychological, sociological or psychobiological factors – rigorous childhood training and religious orthodoxy antagonistic to ganja use, anticipatory socialization to upward mobility in that smoking in public with lower-class peers is considered undesirable behavior by the middle class and possible physiological sensitivities to cannabis. Whatever the underlying factors, idiosyncratic negative reactions to ganja smoking are recognized in the working-class ganja subculture and expressed by the ubiquitous phrase, "he doesn't have the head for it." Unfavorable reactions to the first smoking experience apparently provide a means of psychocultural validation for the non-smoker and relieve him of social pressure to continue to test his capacity.

A survey carried out in 1970 at the Bellevue Mental Hospital in Kingston, Jamaica, concerning the adverse psychological effects of ganja, cites quotations from patients stressing similar factors that apparently served as a screening device for non-smoking:

On one occasion I smoked it and began to feel strange in the head .... This experience prompted me to stop using ganja. My brain cannot take ganja smoking.
I once had a period of mental disturbance after using ganja .... I was very frightened (Prince, Greenfield and Marriott 1972: 7).

2. Similarly it is reported that in Peru "many upwardly mobile Indians, striving for higher status, denied chewing coca and did not publicly chew, thereby avoiding the stigma of Indian identities. It was clear that a tradition having a great deal of social-psychological and instrumental value in a familiar setting had become problematic to the individual as a result of the contrasting values of the larger system" (Fabrega and Manning 1972: 248).

3. Brodie et al. (1971) point out that allergic responses to drugs may be mediated through antigens that may be formed by the reaction of body protein with trace amounts of an active metabolite of the drug. There are individual variations. Also see U.S. DHEW 1972.
Although there is no data in the Bellevue report on frequency or quantity of previous use, it is apparent that a specific negative experience served as the cut-off point by establishing that "the brain can't take it." A number of reports have pointed out the occurrence of adverse reactions among naive users to the initial smoking experience. A World Health Organization report noted, " Syndromes resembling acute intoxication may occur following relatively small doses of cannabis, e.g., after smoking one cigarette, especially among 'naive' users" (WHO 1971: 25).

All subjects in the project sample reported smoking only small quantities of ganja on their first attempt. The quantity of the first smoke ranged only from one draw to one spliff. Most subjects reported "curiosity" as the primary motivation for the initial smoke, frequently defining curiosity as whether they could "take it" or "had the head for it." The first experience was often phrased in terms of a "try" or a "test." One subject who smoked an entire spliff on his first attempt reported that "I wanted to try it and I tried it and got through," that is, he passed the test.

Summarizing reactions to their first experience, 29 of the 30 smokers reported a "good" first experience. In contrast 7 of the 16 controls who had an initial smoking experience reported no reactions, 3 had a positive reaction and 6 reported a "bad" first experience. Negative reactions included "dizziness," "depression" and "fear of mad." The expression "fear of mad," as used in Jamaica, may mean fear of getting angry as well as fear of insanity, although the latter is also phrased as "get off your brain" or "get off your head." The exact definition is not always clear.

The content of negative experiences recalled includes the following:

I tried it once and it made me feel like I was going out of my head. I do in fact feel that it is a good thing, but it is not for me that way.

The subject, a control, reported that 10 minutes after the first draw, given to him by a prostitute, "My head begun spinning," and "I had to lie down." He had also "heard of people that it has sent crazy" and noted that "passing the spliff is not hygienic." Interestingly, no other subject mentioned concerns about hygiene. One subject, eight years old at the time of his first experience, reported:
It choked me very much. He [his brother] encouraged me for another try but I said no. I heard it was dangerous. My head was spinning.

The subject had a “second try” at the age of 16 and reported, “All the whole world of insects and animals I think I hear crying and bawling.” That was the subject’s last try.

One of the controls, a staunch member of the Church of God, recalled his first try as follows:

It's detrimental to my body, it made me eat 26 buns and take 4 quarts of sugar and water [an antidote]. Eating that amount [after smoking] if you don’t have the money [to buy the food] you would steal and when you steal you get into trouble. So it can’t be good.

He was the only subject to report a ravenous appetite in reaction to ganja smoking. Apparently the cost of maintaining such an appetite was overwhelming, and he has never smoked since.

Another control reported: “I wanted a long time to get some experience of the thing but I was afraid to go in company and smoke it. Because the government is against it and I didn’t want to get caught.” A spliff, given to him by his stepfather when he was 13 years old, caused “dry mouth,” “spitting,” “foggy” eyes and sleepiness. When he awoke he “felt dizzy and hungry and wanted to throw up.” He added, “I understand that some people saw a little woman dancing before them but I never see anything.”

The first experience may serve as a rite de passage to the ganja subculture. In many cases, it also signals the transition from boyhood concerns to manhood: “After he smokes he becomes more ‘conscious’ he cannot roam about anymore like a little boy.” This transition is more closely linked, however, to growing economic independence from the family of orientation, as signaled by the ability to purchase one’s own supply, rather than to the specific time of the initial smoke. Adult status can be more clearly marked at the age of onset of regular use, about 15 years – when the boy “comes up in manship” – rather than at the age of the first experience, which may be several years earlier.

The ganja syndrome includes expectations of feelings of sociability, concentration, meditation and relaxation, as well as the
special occurrence of a vision on the first experience. The subjects who achieved all or most of these experiences became regular smokers.

Ten of the smokers reported vision episodes, more than half on their first ganja smoking experience. This patterned vision of the "little old lady" is quite standardized and definitely appears to validate smoker status: "You can't tell some man that when you smoked herb you don't see old lady." The major features of the reported vision appear in the following account:

I felt happy, man, I felt happy when I used it that first time. Now the first thing I saw (I was just going into a little doze) is a little woman about this length [three feet tall]. But stoutier than a drum and all dressed in pure green. And she wheeled and wheeled and she wheeled, her face was all around, and she wheeled and she wheeled and I was there, admiring, admiring. And now I got to wake up, I saw she had a little rod, just about like this, and she wheeled and came toward me and I opened my eyes. And I just woke up and didn't see her again. And the next morning I did my work as nice as ever. I tried it and it did good. So I say this thing must be good. I started to use it regular.

The "little lady" in the vision may be dressed in various colors, red, white, green; the pattern of the vision may vary somewhat, as in that of "little men," dressed in different colors, described in the following:

Gradually as I was growing up and I saw the others smoking and nothing happened to them, I got into it and I smoked it too. The first time I enjoyed myself because I saw little men in red dancing before me. And I just took it and amused myself. And I considered that must be how everybody feels when they take it the first time. And I just enjoyed myself with the little men I see until I left. Just some short men, they had on red clothes and they danced. About ten of them, it was just a little group of them going on with some dancing before me. [They were] different, different colors — some looked white and some looked like black men and some looked like brown men. They were smiling like something "sweet" them and I just humoured
the joke with them. They never spoke, they just danced until they disappeared. It didn’t make me feel dizzy, for I was conscious. [It never gave you any “visions” apart from that?] No, after I smoked it the first time I smoked it again and I just felt normal as any other man.

In addition to the specific visions reported, a number of subjects gave second person (“dem say”) accounts: “It makes them see the little people.”

Sometimes I hear people say they see a little old lady come before them and dance and laugh and do all sorts of things, and it makes them feel like doing the same things.

The culturally standard vision of the “little dancing” person; male or female, which characterizes the first ganja experience for some, may be comparable to the vision quest for guardian spirits of the Plains Indians of North America. Among various Plains Indian societies, the vision “designates a culturally prescribed dream, hallucinations, or any unusual auditory or visual stimulus which is interpreted as a communication from supernatural entities and results in the recipient’s acquisition of power, advice, or ritual privileges” (Albers and Parker 1971: 203). The vision-quest was an institutionalized phenomenon: “The manifest content of the standardized visions was highly stereotyped and stylized with regard to their form, symbolic content and behavioral directives.”

Sociocultural interpretation of the Plains Indian collective visions include the concepts that “the vision functioned as an anticipatory socialization device, easing problems of role transition” and that “in some social contexts the vision served to solidify the individual’s identification and cohesion with societal organizations” (Albers and Parker 1971: 205). Tentative functional analogies may be drawn between these vision experiences. The ganja vision also confirms the role of the smoker and his transition into the ganja subculture, possibly even his transition to “mankind,” and solidifies his “identification and cohesion” with the peer group. The analogy

4. Reichel-Dolmatoff, describing a hallucinogenic cult in the Amazon, observes that the visions induced by hallucinogenic drugs are standardized and that younger members of the cult group “still do not have well-defined hallucinations” (197b: 173).
cannot be carried too far: recent research indicates that there were structural and role limitations on both the Plains vision quest and its outcome. When the vision validated ascribed status, "unsuccessful individuals" did not dream; but when the vision was employed as a functional device to achieve new status, the individual had to verify the credibility of his vision through socially recognized achievements (Albers and Parker 1971).

As noted, ten smokers in the project sample reported in standardized form the personal experience of the vision, and second person accounts were frequently related by other subjects, non-smokers as well as smokers. The phenomenon appears to represent a collective vision, or myth, related to initiation into the ganja subculture and perhaps to origins of ganja use in Jamaica. More intensive research would be required to determine the pervasiveness of the vision experience, whether it represents a "quest" that validates smoking and perhaps grants special status in the peer group, and whether social psychological traits characterize the individuals who experience the vision.

_**Attitudes toward non-smokers**_

One of the factors related to ganja use which was introduced by the subjects was the folk definition of accepted idiosyncratic differences in "capacity" to smoke cannabis:

Personally it doesn't [negatively] effect me but it might effect another man. His brains are light and he can't take it. So it can make him a fool, make him act like an idiot. But a man who can smoke it, it doesn't do him anything [negative]. If the brain is weak it can have effect ['effect' is defined as a negative consequence] but if the brain is strong, no effect.

Apparently a psychologically negative predisposition, conscious or unconscious, to ganja smoking is sufficient to insure a "bad trip" and to convince a peer group of an individual's incapacity to become a ganja smoker. There may be group pressure to undergo a first experience; one control reported that he tried it three times, "I made the clique of it, but I couldn't make the grade of it. From that I mess with it no more." Some individuals expressed the concern that they might be considered cowards or, worse still, informers, if they
were unwilling to go through an initial attempt: "I try it, if I didn't take it he would hold me up as an informer." However, there is apparently little or no group pressure on the non-smoker to become a smoker once he has evidenced a negative reaction; the common attitude is that the man "who can't take it" should "just leave it alone."

Social mobility may be a conscious or unconscious factor in conditioning adverse initial reactions among some individuals. Aspirations for improving one's social condition exist despite limited chances of moving from low to higher status. Consequently, initial negative reactions permit the socially aspiring to avoid the stigma attached to lower-class "ganja men" by "respectable people" in the community as well as to avoid alienation from their peers who are regular smokers. There is no overt scorn or antagonism toward non-smokers; in fact, there is a great deal of mutual tolerance, and non-smokers often participate in the social activities of smoking sets: "Everybody has a right to live the way he wants to live as long as [he does] nothing to offend the other man. Every man to his own order."

The cultural rationale that validates non-smoking in the Jamaican working class is structurally significant. It avoids friction and breakdowns in communal and work relations and helps to maintain group solidarity. It also appears to provide a device for screening vulnerable personality types and potential "psychotic" reactions by legitimizing the status of non-smokers. Vulnerable types are thus protected by the cultural validation for non-smoking, and the ganja users are not threatened by possible exposure.

Culturally patterned experiences clearly condition socialization into the ganja subculture and many factors combine to determine whether individuals from similar socioeconomic backgrounds will become regular smokers or non-smokers. The screening device provides individual freedom of choice and serves to avoid potential social casualties among the vulnerable. The screening hypothesis may complement Murphy's thesis (1963: 19), which is shared by Grinspoon (1971: 268), that cannabis may protect some individuals from psychosis. In either case, sociocultural factors permit and structure idiosyncratic differences in reactions to ganja.
Cannabis and alcohol

As compared to rum, *ganja* use in the working class is of relatively recent origin. Rum, a by-product of sugar processing, has been the leading alcoholic beverage of the working class in Jamaica for centuries. Readily available, comparatively cheap and potent, it facilitates male sociability in neighborhood rum shops. In areas with limited means for leisure pursuits, rum shops have traditionally been the principal setting for male congregation and conviviality. After work on week-days and especially on weekends, men gather in these shops to talk, play dominoes and drink. Rum is also consumed in a variety of other settings; it is liberally provided at local dances, on festive occasions and at communal work gatherings and is a requisite for offering hospitality at home. Beer has become a common working-class drink, sometimes consumed in large quantities, while whiskey, much more costly, is taken less frequently. The use of both beer and rum is class-correlated. Rum is the working-man’s (and tourists’) drink, while whiskey is the preferred middle-class and upper-class drink. The relatively recent but pervasive spread of *ganja* smoking among working-class males invites comparison with patterns of alcohol consumption, particularly in terms of subcultural preferences and sociopsychological functions.

Two recent studies in Jamaica indicate that economic factors may be critical in the differential usage of *ganja* and alcohol in the working class. According to the Jamaican Department of Statistics, Jamaicans spent J$15,319,000 (US$45,975,000), on alcoholic beverages in 1965. With a population at that time of 1,788,200, per capita expenditure was US$25.70. Taking the drinking age population – those 15 years and over – as the baseline, the per capita expenditure was approximately US$48.00. In 1966 the Department of Psychiatry of the University of the West Indies conducted a survey of the drinking practices of 1,377 Jamaicans in a Kingston suburb. The survey established that “the highest rates of drinking were in the 40–44 age group and the proportion of heavy drinkers increased as household income increased. Jamaicans of African origin showed comparatively low rates of heavy drinking,” as compared to the British residents who “had the highest rate of heavy drinking” and “other whites” who “showed highest rates of excessive drinking.” Weekend drinking, however, was reported to be
“heaviest among the lowest class, no doubt because of weekly pay day” (Bea brun 1967: 7, 30, 19).

Linking ethnic and age differences in drinking rates to social class factors, Bea brun, director of the survey, postulated “that Jamaicans of African origin show low rates of heavy drinking may mean no more than that they are on the lowest socioeconomic rung and have a slightly greater proportion of women.” He further indicated that “ganja smoking is widespread, though illegal, and may play a role as an alcohol substitute” (Bea brun 1967:20). Following this “hunch” of Bea brun, Prince and his colleagues examined the hypothesis that ganja functions as a “benevolent alternative” to alcohol. They cited economic circumstances as a major factor: “For many poor Jamaican males, ganja does serve as a substitute for alcohol and is used mainly because it is cheaper” (Prince, Greenfield and Marriott 1972: 5).

Life history data from the sample population of the study fail to support the economic thesis that cannabis is the poor man’s substitute for alcohol. Subjects perceive the issue from a somewhat different perspective, viewing ganja as a “benevolent alternative” to alcohol, not in terms of costs, but in their perception of differential effects. In this respect, ganja appears to be a discretionary option.

Carstairs’ 1951 study of differences in alcohol and cannabis use by two caste groups in the village of Rajasthan, India, is apposite. Carstairs pointed to cultural factors underlying the caste choices: Daru, a potent alcoholic drink, was the choice of the Rajput caste of warrior-rulers, while bhang, a cannabis infusion, was the drink of the Brahmins. Carstairs notes that both castes “belonged to the economically privileged section of the community” and that both hold basic Hindu values in common; Brahmins, however, “have a special obligation to lead a pious life — and abstinence from meat and alcohol is a prime essential.” The Rajputs represent the temporal aristocracy and are “committed to a life of action rather than of contemplation.” Carstairs analyzes cultural and personality factors involved in the different structural role expectations: “Rajputs... are taught to put great stress on individual bravery and ferocity in the face of danger... every young Rajput lives with the anxiety that he may not prove adequate to the occasion when it comes. As a result he tends to be boastful, touchy, and readily inclined to assuage his anxieties in the convivial relaxation of a drinking party.”
Brahmins, in contrast, strictly abstain from alcohol but use bhang in support of their value system and life-style (Carstairs 1966: 113–116).

Although there is no clear-cut demarcation between ganja and alcohol consumption in Jamaica and ganja users generally are not teetotalers, there are differences in quantity and frequency of ganja and alcohol consumption, and particularly in the values attached to their use. Universally, the smoker sub-sample preferred ganja to alcohol, citing differences in their reactions rather than economic factors as the principal rationale. Aggressiveness and loss of control are seen as the disvalued effects of rum drinking, as opposed to the perceived beneficial reactions to smoking ganja. In this regard, when questioned about their attitudes to anti-ganja legislation, subjects frequently responded: “Rum dem should stop [not ganja].” Smokers unequivocally maintained that ganja is superior to alcohol. This, however, is not seen as an either/or alternative. Smokers tended to be occasional to moderate drinkers; more heavy drinkers were among the control sub-sample. Only two subjects in the total sample were teetotalers; both were controls who had previously been drinkers; two of the smokers reported reducing alcohol intake and related the reduction to ganja smoking.

Working-class users prefer ganja to rum. They emphasize the energizing, therapeutic, benevolent, spiritual and socializing effects of ganja, contrasting it to the potentially debilitating, intoxicating, antisocial and malevolent effects of rum expressed in the proverb, “when di rum is in, di wit is out.” Like the Brahmins of Rajasthan, they vigorously approve the one and strongly depurate the other, proffering examples of observed differences in behavior to support their preference. While this might be seen merely as a rationale masking real lack of choice because of very limited incomes, non-users generally agree with users in assessing the qualitative differences in reactions. Based on their observations, most believe that alcohol is more harmful; and many also express the opinion that tobacco is more harmful than ganja. The following typify the attitudes of ganja smokers to alcohol:

5. The finding that cannabis smokers consume less alcohol than non-smokers has been reported by Kaplan (1970: 293–294) and Zinberg and Robertson (1972: 63–64).
6. Brecher et al. note that “many marijuana smokers whose marijuana supply is cut off increase their alcohol consumption (1972: 264).
I doan see no problem because when I find myself smoking I find dat I keep more consciously dan when I drinking. When I see di man dem drink di rum, dem fooley, fooley, but if a man tek a good smoke him suppose to wiser dan him. Him suppose to sensible more dan him. I rather it more dan di beer or di rum. For when I drink di beer or di rum I will fall down but when I smoke this I know I can't fall down. I don't drink rum or beer – once in a blue moon. It mek me upstir. Di least little drink I tek I get drunk.

Although the frequency and quantity of ganja use may be conditioned by economic factors – especially during periods of unemployment or of higher costs of ganja due to seasonal shortages – considerable sums are spent on ganja, considering average incomes, especially by heavy users. In addition, the working-class principle of reciprocity is operative in both ganja and alcohol use. When funds are low, peer groups share available resources on a reciprocal basis.

Social class and legal factors also differentiate the use of ganja and of alcohol in Jamaica. Although ganja use is pervasive in the working class, it is classified as an illicit “drug,” subject to severe legal sanctions for cultivation and use. Alcohol, on the other hand, is both legal and accepted by all social classes, so that much greater opprobrium is attached by the society in general to heavy ganja smoking, than to heavy use of alcohol. Ganja use in Jamaica remains essentially a uni-class phenomenon in contrast to the cross-class character of alcohol consumption.

Ganja also conditions intraclass patterns of social relations. Given its illegality, the relatively free use of ganja in small communities where there can be little privacy depends to a considerable extent on group cohesiveness and the consequent absence of accusers and accusations. Punitive legislation against ganja users serves to solidify ganja groups and to support an ordered system of reciprocal relations based on mutual confidence and expectations of personal security. Such interdependence is obviously not essential to drinking sets. While there may be gossip about heavy drinkers, there are no legal sanctions against drinking. Consequently, alcohol use is not usually sanctioned by obeah, or subject to police
denouncements as is the case with ganja use, dealing and cultivating.

In addition, ganja, unlike alcohol, has special symbolic attributes. Rastafarian metaphysics, for example, emphasizes and brings into focus general concepts derived from working-class views of ganja. For them, it is “the wisdom weed,” of divine origin, an elixir vitae, documented by Biblical chapter and verse which overrides man-made proscriptions. Religious authority thus validates and fortifies commitment to its use; there is no need to invoke religious validations of alcohol consumption, which is legally and socially accepted. While drinking in the local bar may enhance feelings of sociability, the sacred source of ganja permits a sense of religious communion, marked by meditation and contemplation.

Again, in contrast to the use of alcohol, ganja use is structured by a range of expectations and reactions that are related to time and activity. To provide “energy,” it is taken in the early morning or before the work period; to enhance relaxation, sociability or meditation, it is taken at the end of the working day; and to foster health and avoid illness, it is taken as situationally required. Specific motivations for use regulate consumption patterns. In Jamaica there is no working-class ganja setting equivalent to the drinking “spree” or the “pot party.”

Ganja and the “amotivational syndrome”

Under certain circumstances, all drugs including aspirin carry risks to the individual (Nowlis 1970–71) and, by extension, to the society. Real and possible risks of drug use have evoked a variety of reactions in different countries. The recent spread of marihuana use among middle-class youth in the United States, for example, aroused public attention and alarm about the alleged correlation of cannabis use with the behavior of members of the “counter-culture.” Even “the alienation” of affluent American youth has been unilaterally attributed to marihuana use. In other cannabis-using countries, particularly in the developing world, socially undesirable behavior of the lower class is commonly attributed to the use of cannabis. As might be expected, public opinion toward lower-class ganja users in Jamaica reflects these negative attitudes. Public concern, however, as in other countries, is often circumscribed by political partisanship, as is indicated in Chapter III on ganja legislation.
Legislative debates on the drug codes often linked "the evil of ganja" to crime statistics without any substantiation of the alleged causation of ganja to crime. In one rare attempt to answer this charge, an Opposition member pointed out that the incidence of ganja use in Jamaica increased at a rate far more rapidly than the incidence of crime. Furthermore, reported crime rates during the economic boom of the 1950s were the lowest of the century with no reported decrease of ganja use in the country. The legislative debates also dwelt on two other alleged effects of ganja – passivity and non-productivity – quite opposite to violence. One legislator phrased this opinion as follows: "The long-term effects create in a person indolence and laziness and you can well see the social repercussions of this." Such statements fail to clarify whether ganja presumably produced both aggressiveness and apathy in the same individuals.

Similar allegations about passivity that appear in the literature are increasingly being questioned by many scientists. The major exception to this trend has been the thorny question of the effect of cannabis on motivation. As Grinspoon observes, "Of all the deleterious effects which cannabis use is alleged to cause, personality change, especially with regard to heavy use, is the most difficult to refute...." Clinical reports of "personality change" related to the use of cannabis are interpreted as manifestations of the "amotivational syndrome" – "a purposeful and extensive change in lifestyle." However, he continues, "It appears that the determinants of this type of change are more likely to be found in predisposing personality problems and in disaffection with the social system than in the moderate social use of the drug marihuana." (Grinspoon 1971: 289–290).

The "amotivational syndrome" has been described as a loss of desire to work, to compete, and to face challenges. The DHEW report to the United States Congress in 1971 noted:

The fact that there are many worldwide reports of heavy, chronic cannabis use resulting in loss of conventional motivation and in social indifference is of particular interest in that there are now some reports of somewhat similar findings among American heavy users of marihuana. Unfortunately, American use patterns are frequently contaminated by the use of other
drug substances, making interpretation difficult. It is not
certain to what degree this “amotivational syndrome” is the
result of marihuana use _per se_ or of a tendency for those who
lack conventional motivation to find drugs unusually attractive.
If one confines his use of the term to a description of the
present American scene one must conclude that present
evidence does not permit the establishment of a causal relation-
ship between marihuana use and the amotivational syndrome.
There is, however, increasing evidence that frequent, heavy
marihuana use is correlated with a loss of interest in conven-
tional goals and the development of a kind of lethargy (U.S.
DHEW 1971: 8).

The DHEW report further pointed out, however, “The question
of whether there exists a significant causal relationship between
cannabis and a motivational syndrome or only an associative or
correlational relationship of a person possessing these traits and
cannabis use, remains to be answered” (U.S. DHEW 1971: 75).

Comparison of the motivations for _ganja_ use and of culturally
standardized expectations among users in the United States and
Jamaica is meaningful only in a cultural and structural context.
The “pot heads” from middle-class North American backgrounds
whose choice is to “drop out” of conventional life styles and to adopt
the life style of the “counter-culture,” who experiment with various
drugs and find them unusually attractive, apparently are psycho-
logically predisposed to reject the conventional values of their
society. Weil suggests that in the United States “amotivation [is]
a cause of heavy marihuana smoking rather than the reverse”
(1972: 60). The Jamaican working-class user who seeks energizing
as well as euphoriant and medicinal effects from _ganja_ is responding
to a different set of social and personal conditioning factors: the
need to work at hard and onerous tasks in cultivating the land, to
stave off cold and hunger at sea, to provide self-medication in the
absence of adequate health care, to enhance enjoyment of social
relations in the absence of alternatives for leisure pursuits, to
augment income and to realize the sacred-secular virtues attributed
to _ganja_ in folk belief – wisdom, knowledge and understanding.

The context of use in Jamaica and the United States, the social
class backgrounds of the users, the motivations for use, the situation-
ally determined expectations and reactions are for the most part completely different. Furthermore, as has been previously noted, ganja is a total nostrum for the Jamaican working class; there is no multiple drug use and very limited use of any synthetic drugs or of other psychoactive plants from the folk pharmacopoeia. This difference in emphasis stems from folk beliefs in the attributes of native plants. Working-class Jamaican use of ganja is in the general tradition of folk herbas. Native medicines are not considered "drugs," and belief in the divine origin of ganja bolsters this concept. Despite the availability of hard drugs in the tourist areas, Jamaican ganja users do not evince interest in experimenting with other drugs and, in fact, disapprove of their use. For the Jamaican working-class user, ganja has clearly defined practical as well as spiritual attributes, with the pragmatic qualities outweighing the mystical in terms of perceived needs and life chances, particularly in situations of limited social mobility.

The majority of the population is in the low income, low status bracket, semi-skilled in terms of modern technology, with limited formal education. Realization of their limited life chances and their impotence in decision-making processes affects attitudes toward government and political participation. But this is true of smokers and non-smokers alike and reflects pervasive working-class attitudes. Nevertheless, lower-class Jamaicans do not "sink into apathy," ignore family responsibilities, refuse to work, avoid normal social interactions and so forth. In fact, they are responsible to family members, to friends and peers; they maintain normative levels of hygiene and personal appearance and are industrious workers. In a demanding environment, with limited life chances, the working-class smoker cannot afford to and does not neglect his tasks. In this context, ganja is perceived as beneficial to concentration and to problem solving, as well as energy giving for arduous tasks. There

7. For example, Weil suggests that the preference of South American Indians "... for natural drugs [is] one reason why they do not have a drug problem" (1972: 105).

8. Similar information about the uses of bhang in India has been reported by the Chopras: "Cannabis drugs are reputed to alleviate fatigue and also to increase staying power in severe physical stress. In India, fishermen, boatmen, laundrmen and farmers, who daily have to spend long hours in rivers, tanks and waterlogged fields, often resort to cannabis in some form, in the belief that it will give them a certain amount of protection against catching cold. Mendicants who roam about aimlessly in different parts of India and pilgrims who have to do long
is no evidence that in Jamaica regular use of ganja by peasants and fishermen "is correlated with a loss of interest in conventional goals and the development of a kind of lethargy" (U.S. DHEW 1971: 8).

On the contrary, from the overall project findings, it is apparent that ganja use is related to a "motivational" syndrome, even though motivation to work may not be correlated with increased levels of productivity. The project study reported in Chapter V points up the complex interrelationships of ganja use and population, land and economic pressures. In this community, land resources are scarce, farms small, cultivation difficult on the hilly slopes and income from cash crops circumscribed by market fluctuations. International migration restrictions add to population pressures on limited land and job resources. Data from this community demonstrates that work for some tasks is less productive after ganja smoking even though the worker expends more energy than when not smoking. For example, heavy use of ganja appears to decrease total cultivated acreage somewhat. This may be argued to limit the disruptive effects of competition for scarce land resources and market outlets and to maintain social cohesiveness among farmers. In any case, heavy use of ganja does not curtail the motivation to work. On the contrary, it seemingly makes possible adherence to arduous tasks with relatively limited potential returns. Heavy ganja use in areas such as the one studied supports the status quo, psychologically as well as structurally.

There is no evidence of the "amotivational syndrome" in the findings from the present study. The research staff had no difficulty locating employed, stable subjects who were long-term regular users, representative of their working-class section. Drifters ("scufflers" in Jamaican parlance) exist, especially in the urban areas, as

marches often use cannabis either occasionally or habitually. Sadhus and fakirs visiting religious shrines usually carry some bhang or ganja with them and often take it. It is not an uncommon sight to see them sitting in a circle and enjoying a smoke of ganja in the vicinity of a temple or a mosque. Labourers who have to do hard physical work use cannabis in small quantities to alleviate the sense of fatigue, depression and sometimes hunger. A common practice amongst labourers engaged on building or excavation work is to have a few pulls at a ganja pipe or to drink a glass of bhang towards the evening. This produces a sense of well-being, relieves fatigue, stimulates the appetite, and induces a feeling of mild stimulation, which enables the worker to bear more cheerfully the strain and perhaps the monotony of the daily routine of life" (Chopra and Chopra 1957: 13).
in the urban slums of many societies. They may or may not be heavy ganja users; whether ganja use is a correlation or a cause of social instability cannot be determined short of long-term case studies to examine all the interrelated factors. Scufflers, however, are a very small minority of the lower class and, as demonstrated by the research findings, working-class users are responsible members of their social group.

Ganja and social pathology

Chronic long-term use of cannabis has historically been endemic in the lower socioeconomic strata of underdeveloped world areas with rigid systems of social stratification by class or caste. In Jamaica, as in most world areas with chronic long-term use, the "cannabis habit" has been circumscribed by social class status. The principal consumers are peasants, workers, the unemployed and racial and social minority groups. Extensive use by the lower class in Egypt, India and Morocco and the early use in the United States by Mexican laborers and jazz musicians reveal similar social class configurations. The initial spread to the middle class in the United States was to the youth counter-culture, also a minority in relation to the mainstream of society.

Stereotypes about the effects of cannabis fall into two diametrically opposed behavioral modes: aggression and apathy. On the one hand, cannabis has been linked with sex, crime, violence and insanity, and, on the other, with slothfulness, extreme passivity, moral degeneration and non-productivity. Members of higher social strata have linked both extremes with stereotypes of lower-class behavior. Cannabis may serve as the scapegoat for broad social problems. Economic, educational, health, nutritional and social factors in extreme aggressiveness and apathy, and biosociogenic factors in mental illness, are often overlooked, while the cause of social pathology is attributed to the "demon" cannabis, documented reports to the contrary notwithstanding.

A substantial literature now questions the allegations of a cause-and-effect relationship between cannabis and social pathology. Recognition of correlative social and economic factors in assessing health and productivity and of basic personality factors in insanity has been indicated in a number of reports and reviews of the
literature (Great Britain 1969; Mayor's Committee on Marihuana 1944; Murphy 1963; Allentuck and Bowman 1942). The public is generally ignorant of this literature and researchers themselves sometimes appear to be unfamiliar with the backlog of scientific reports and reviews. The press frequently exacerbates the situation with scare headlines based on methodologically questionable reports: "Marijuana is linked to Brain Damage" (New York Times, 12/14/71); "Doctors: Ganja is a Brain Killer" (Express [Trinidad and Tobago] 12/4/71) and "Ganja Users Risk Brain Damage" (The Daily Gleaner [Jamaica], 12/22/71).  

Mental illness

The Indian Hemp Drugs Commission of 1894, as previously noted, was appointed to "inquire into ... the effect of their consumption upon the social and moral condition of the people" and, among other particulars, "the physical and other effects of the use of hemp drugs should be thoroughly investigated ... [to] thoroughly examine the testimony in support of the commonly received opinion that the use of hemp drugs is a frequent cause of lunacy" (Great Britain 1969: 1-2).

In addition to the testimony taken from 1193 witnesses, the Commission, which traveled throughout all the provinces, "exhaustively analyzed ... the records ... of every mental hospital in British India." (p. vi) In their report the Commission noted:

There exists undoubtedly a popular impression which has come down from many generations that there is some connection between hemp drugs and insanity. Besides this popular impression, there has been great prominence given to asylum statistics as affording some tangible ground for judging of the effects of hemp drugs. Over and over again the statistics of Indian asylums have been referred to in official documents or scientific treatises not only in this country, but also in other countries where the use of these drugs has demanded attention. Other alleged effects of the drugs have attracted but little

9. Recent testimony before the U.S. Senate Internal Security Subcommittee alleged that "there is significant evidence of cerebral atrophy in young cannabis smokers" (New York Times, 9/19/72). No evidence was cited in the report.
attention compared with their alleged connection with insanity. (p. 225)

The Report of the Commission points out that the classification of ganja insanity was reinforced by the attitudes of asylum superintendents to whom cases of insanity were brought that had been "attributed with apparent authority to hemp drugs" (p. 226).

However, the Commission in examining the statistics of the lunatic asylums soon found that they could not be regarded as trustworthy. The case records of insanity attributed to hemp drugs were examined in detail and intensive interviews held with asylum superintendents. The Commission noted "the practice to enter hemp drugs as the cause of insanity" where the patient was known to use them and that the "cause (of insanity) column" was often changed from "unknown" to "ganja smoking" (p. 233). The Commissioners accepted the existence of "acute ganja intoxication," of short duration, but noted that "the majority of medical witnesses who have studied the subject are clearly of [the] opinion that there is nothing typical in the symptomatology of hemp drug mania to distinguish it from mania due to other causes" (p. 247).

The "commonly received opinion that the use of hemp drugs is a frequent cause of lunacy," as noted by the Hemp Drugs Commission (p. 2) has diminished considerably in the intervening 75 years, particularly in the United States since the 1940s (Grinspoon 1971: 262). Reports of the psychogenic effects of cannabis continue to appear, however. Manifestations of the states of "acute intoxication" and "acute psychototoxic reactions" reported in the literature "often include paranoid ideas, illusions, hallucinations, depersonalization, delusions, confusion, restlessness and excitement." A WHO Report notes that the "state of acute intoxication" generally occurs "at [the] higher dose levels," but also notes that "syndromes resembling acute intoxication may occur following relatively small doses of cannabis, e.g., after smoking one cigarette, especially among 'naive' users" (1971: 25).

Frequently, reports of the psychogenic effects of cannabis are based on a limited number of cases with inadequate controls for multiple drug use, history of physical or psychological traumas or psychotic predisposition. Critical commentaries on such reports have appeared in the review literature (Murphy 1963; Grinspoon
1971; Snyder 1971), but the methodological cautions may be disregarded. A Lancet article on “Cerebral Atrophy in Young Cannabis Smokers” (A.M.G. Campbell et al. 1971) that created scare newspaper headlines is a case in point. An editorial essay in the same issue of Lancet (p. 1240–1241), entitled “Cannabis Encephalopathy” starts with the comment that “The paper by Dr. Campbell and his colleagues in this issue deserves careful scrutiny. . . . The patients showed the personality and mental disorders that are commonly associated with such ventriculographic findings.” The essay points out, however: “What is not certain is whether these changes are caused [emphasis in original] by the use of cannabis,” and that “it would be wise to avoid the conclusion implicit in their findings considered in isolation.” The cautionary statements in the editorial were not picked up and disseminated with the more sensational article by the international news service.10

A 1970 report on cannabis-induced psychosis, from the mental hospital in Nassau, the Bahamas, described the characteristics of psychosis in nine male patients, aged 18-24 years, who had been admitted to the hospital over a period of six months. The onset of the psychosis was described as “always sudden and it is probable that it is continuous with the effect of the drug taken prior to the illness.” The summary of the findings was as follows:

Nine patients who were known to have taken cannabis in the form of cigarettes were admitted to hospital, the features of the illness being aggressive behavior, gross psychomotor overactivity, bizarre grandiose delusions, passivity and an amnesia for the onset of their illness. Following the acute phase of the illness a chronic picture gradually presents lasting an indefinite time characterised by a persistence of the amnesia, flattening of affect and a mild to moderate degree of remaining thought fragmentation (Spencer 1970:260).

Discussing the nature of the illness and the relationship to taking cannabis, Spencer observes, “It would seem that specific psychosis of a severe and semi-permanent nature may occur following cannabis intake and it is suggested that the drug acts as a precipitating

10. See also review by Grinspoon (1972) of the study by A.M.G. Campbell et al.
factor in predisposed individuals” (p. 228). The article excludes possible contamination with LSD or amphetamines, but presents no data on duration, frequency, quantity or potency of the cannabis used, apart from the statement that the patients “were known to have taken cannabis.”

A Jamaican survey conducted in 1970 by Prince, Greenfield and Marriott (1972) of ganja use among 112 male admissions to the demonstration ward of Bellevue, the mental hospital in Kingston, reported the following findings concerning adverse mental effects of ganja: “Although some 10 percent of our hospitalized sample mentioned the danger of ganja causing some form of mental trouble, when the patients were asked directly about adverse mental effects upon themselves, the response was largely negative.... But three patients gave clear examples of how ganja had produced some kind of mental disturbance.” The authors concluded that “it is clear that short-lived episodes of anxiety and confusion may be produced in some individuals as described above.” However, the authors then question whether “such episodes ever warrant admission to mental hospital in the Jamaican setting.” The report continues: “Our two years’ experience at Bellevue leads us to believe that such episodes seldom provide grounds for admission. We did not see a single case of such a short-lived toxic kind of reaction.” The authors further note that in a study by Marriott of 196 consecutive admissions to the psychiatric unit of the University Hospital, “only one was diagnosed as an acute toxic confusional state due to ganja.” Comparing ganja use among hospitalized and non-hospitalized males (based on “key informant” reports), the survey established that “the percentage of heavy ganja users at large was, if anything, higher than the percentage of ganja users on the ward” [emphasis in original]. The authors state, “This finding would support our opinion that ganja use is not a significant cause of psychosis. The so-called ‘ganja psychosis’ is schizophrenia occurring in a ganja-using population” (p. 6-7).

The Bellevue survey (stemming from the conjecture by Beaubrun 1967 that ganja is a substitute for rum in the Jamaican working-class) examined the hypothesis “that the use of ganja as a euphoriant by low-income Jamaicans is a benevolent alternative to alcohol....” The researchers consider that in fact ganja “may protect [the individual] against the consequences of alcohol consumption – alcohol
addiction, delirium tremens, chronic brain syndromes, Korsakoff psychosis and physical sequelae, such as cirrhosis of the liver” (Prince, Greenfield and Marriott 1972:1).

Ten of the subjects in the present Jamaican ganja study sample revealed a history of family mental illness, and one smoker and one non-smoker gave histories of past mental illness. The psychiatric report (see Chapter VIII) noted that “the smoker had been hospitalized for a schizophreniform illness which might have been provoked by heavy cannabis use.” Records of admission to a mental hospital for family members of the subjects are not available, and no current hospital census exists of causes for institutionalization. A census carried out in 1961 (Research Institute for the Study of Man) provided no data on ganja-correlated psychoses.

The commonly received opinion in Jamaica that some people “don’t have the head for it,” without any evidence of “casualties” either from the mental hospitals or from the communities studied, has led to the hypothesis that a cultural mechanism among Jamaican users may screen “vulnerable personalities.” This is in consideration of the possibility that ganja may induce acute psychotic reactions in predisposed individuals, although there is no supporting evidence for this conjecture in the present study.

As Professor Kaplan has pointed out: “No one has ever denied that people who smoke marijuana could commit violent and aggressive crimes or become insane — just as people who smoke cigarettes can, and for that matter, people who use no drugs at all. Nor can we deny that somebody actually under the influence of marijuana can commit a violent and aggressive crime or experience a psychotic episode. The question is: does marijuana smoking either in the long or short run, make an individual more or less likely to commit a violent crime or to become insane; in other words, is marijuana in any causal way related to either of these phenomena” (Great Britain 1969: ix, emphasis in original). No evidence of such causality appeared in the findings of the Jamaica Project.
The elements of the Jamaica ganja complex that have been described stem from a traditional folk stream of cannabis use which reveals a remarkable continuity in various cultures. Recent research points to the development of two major cultural complexes related to the use of cannabis: the "ganja complex" and a sociocultural configuration that may be termed the "marihuana complex" stemming from the psychedelic context of cannabis use in the United States and its diffusion to Western-oriented youth in other societies (Rubin 1974). The traditional "set and setting" of the Jamaican ganja user differs significantly from that of the marihuana user. The contrasts between the Western and traditional modes of use are germane to an understanding of man's relationship to cannabis and cultural factors that influence reactions to cannabis.

The comparatively late spread of marihuana smoking to middle-class youth in the United States has been attributed to the "electronic origins" of the cultural revolution of the 1960s. Following McLuhan's theory of the "message" of the media, it is postulated that "psychedelic fallout, in the form of music, light-shows, new cinematic techniques ... inundated" the United States "with the mystique of the electrochemical turn on" (Zinberg and Robertson 1972: 67). Even the phrases "tune-in," "turn-on" and "turn-off" are derived from television. For the television generation, it may be said that "electronics preceded chemistry" as a technique for "alteration of consciousness" (Geller and Boas 1969).

In the United States, however, reactions to marihuana have differed dramatically during various periods. Marihuana as a mood-
altering substance was generally unknown when it was first introduced in the United States from Mexico after World War I (Weil 1972). Panic reactions were common during the early period of its use, but such reactions became increasingly rare after the mid-1930s. As marijuana use spread, less anxiety was attached to it. Any drug can trigger a state of extreme anxiety, as has frequently been observed, whether or not the panic reaction has a pharmacological basis. Nevertheless, allegations about the physical, social and moral “dangers” of marijuana re-emerge in cyclical waves that may reflect the Zeitgeist more than the pharmacological properties of the plant. As McGlothlin (1974) indicates: “The data clearly show that the amount of THC taken by the typical U.S. marijuana user is quite small in comparison to that consumed in cultures where cannabis has been used for many years. Certainly, the estimated 5 mg of THC per occasion for casual users is almost trivial. This supports the argument that factors other than the pharmacological effects have played an important role in the recent adoption of marijuana use by large numbers of middle-class youth.” A table prepared by McGlothlin on the estimated THC content of cannabis used in the United States and other countries appears in Appendix VI.

Recognition that the pharmacological action of a drug is mediated by “set and setting” is on the increase. “It is quite possible for the combined effects of set [individual expectation] and setting [total physical and social environment] to completely overshadow the pharmacological action of a drug ... The more the drug can be considered psychoactive (in that a principal reason for ingesting the substance is related to desired changes in mood, emotion, perceptions), the more set and setting are crucial” (Zinberg and Robertson 1972: 95; see also Becker 1963; and Weil 1972).

The “set” of the individual is culturally conditioned and the “social environment” modifies the cannabis-man relationship. If the “electrochemical turn-on” was the background for marijuana use in the United States, in Jamaica, the traditional folk pharmacopoeia serves as the background for the use of ganja. Furthermore, an established body of folklore about ganja use conditions the psycho-cultural expectations and reactions of both smokers and non-smokers. The nature of reactions to the first experience, whether positive or adverse (similar to “novice anxiety reactions”), generally determines whether the initiate becomes a regular smoker. Idio-
syncratic differences in initial reactions are recognized and respected in the ganja subculture and help to support the neophyte in becoming – or not becoming – a smoker.

For example, the 29 smokers of the project sample who reported a positive first experience recalled feelings of sociability and “merriment,” that is, making jokes in Jamaican idiom. None had recollections of uncontrolled laughter as is occasionally reported in the United States or the “merry mania” described by the Indian Hemp Drugs Commission (Great Britain 1969). Frequently recalled reactions to the first experience by the Jamaican smokers were “meditation,” “concentration,” “relaxation” and “visions.”

Hallucinations

Cultural variables undoubtedly condition hallucinogenic reactions to cannabis. The vivid accounts of reactions to hashish smoking by Baudelaire, Gautier and their contemporaries, provided the backdrop for Western cultural expectations and social concerns. Gautier’s fantastic description of his reactions to “the greenish paste” focused on the bizarre: “Hallucination, that strange guest had set up his dwelling place in me” (Solomon 1966: 168). Even in less baroque Western literature, cannabis has been classified as a hallucinogen, along with lysergic acid diethylamide (LSD), mescaline and psilocybin.

The Jamaican data make it clear that “hallucinations are not an invariable consequence of marijuana use” (Fort 1970–71: 519). In the Jamaican working-class setting, hallucinogenic reactions are apparently neither regularly sought nor generally experienced. The one exception to this, reported by subjects from a rural area generally in relation to their initial smoking experience, is the vision of a “little lady” who dances and beckons the smoker, usually in a congenial manner. The initial vision was never repeated. Probing produced a few reports about occasional, non-specific hallucinations, said to have been experienced by others and always attributed by the narrator to excessive use or use of ganja with alcohol.

A significant psychological difference distinguishes hallucinations from visions; hallucinations are usually idiosyncratic phenomena which may be triggered by personality and/or pharmacological factors; visions are culturally patterned experiences, related to “set
and setting,” usually in the context of a rite de passage. The quantity and potency of the initial “smoke” by the Jamaican subjects would not warrant a pharmacological explanation of the phenomenon and certainly not of the patterned cultural content of the vision.

Similar folk uses and reactions to other plants, not generally considered hallucinogens, have been reported. Tobacco (Nicotiana spp.), for example, which has been used in folk medicine and magic by American Indians is also “a vehicle for ecstacy.” Wilbert reports that among the Warao Indians of Venezuela the role of tobacco as a vehicle of the vision quest is “obviously [a] cultural conditioning toward specific ecstatic experiences that have nothing to do with the chemical action of the tobacco plant itself” (1972: 80).

Some observers, apparently baffled by the diversity of reactions attributed to cannabis, ascribe these phenomena to an innate, if unknown, characteristic of the plant. Thus, psychopharmacological studies have given rise to the suggestion that “the same drug can cause opposite changes in behavior” (Wolstenholme and Knight 1965: 52). These studies have not made clear, however, whether such apparently contradictory reactions might be related to differences in dosage, frequency, THC content or psychological “set and setting.” Some researchers have concluded that titration, or control of the dosage, explains differences in reactions (Grinspoon 1970–71), but others hold the view that “the psychological effects of marijuana are as varied as the range of human personality and as complex as the multiple factors which influence the user each time he smokes” (Bloomquist 1967). A recent pharmacological report, e.g., presents the “lassitude/violence” dichotomy: “At a behavioural level, the subject may experience lassitude to the point of sedation or hyperactivity, hypersensitivity to stimuli and irritability to the point of violence.” The authors note, however, “These widely differing observations may at least in part be explained in terms of differences in the composition of the Cannabis sativa, differences in concentration of active principles and individual variations in response to Cannabis” (Davis and Persaud 1970: 107).

A survey of the literature, “The Cannabis Habit;” by Murphy concluded: “It seems probable that cannabis has a highly complex influence, dependent on personality and culture as well as the drug itself” (1963: 21). In a similar vein, Jones has pointed out that “the effects of psychoactive drugs on behavior and experience are often
independent of the drug’s pharmacologic effect” (1971: 164). 1 Research findings of the present study bolster the opinion that reactions to cannabis use depend more on the individual’s personality, beliefs and expectations than on the pharmacology of the plant itself.

Both as stimulant and sedative, for sacred or secular use, ganja fits into working-class life styles in Jamaica and the regular user’s reactions to ganja stem from this sociocultural framework. Chronic ganja smokers do not report “vivid ideas crowding the brain,” or tendencies to violence or to debauchery2 and wild sex orgies. Such reactions would violate working-class mores. Individual psychosomatic reactions generally reinforce situational sociocultural expectations – endurance, energy, problem solving, alleviation of hunger or invigoration of appetite, enhancement of memory or relaxation – as the situation requires.

**Ganja and society**

At this point, some questions might be raised about possible consequences to the greater society in terms of socioeconomic development. In Jamaica, ganja use is integrally linked to all aspects of working-class social structure: cultivation, cash crops, marketing, economics; consumer-cultivator-dealer networks; intraclass relationships and processes of avoidance or cooperation; parent-child, peer and mate relationships; folk medicine; folk religious doctrines; obeah and gossip sanctions; personality and culture; interclass stereotypes; legal and church sanctions; perceived requisites of behavioral changes for social mobility; and adaptive strategies. Although the structural linkages to society as a whole were not part of the research project and are difficult to investigate, the

1. New light may come from current research on operant conditioning for conscious control of bodily functioning, being undertaken at the Langley Porter Neuropsychiatric Institute and other research centers in the United States. Mechoulam’s research on metabolites may also throw light on adverse psychosomatic reactions reported (see Mechoulam 1970 and Mechoulam et al. 1970).

2. The Hemp Drugs Commission found no tendency to “debauch” with ganja, as occurred with alcohol (Great Britain 1969: 186). Grinspoon discusses at length Baudelaire’s extensive use of opium and alcohol and limited experience with hashish and suggests that “most of the effects he attributed to hashish were in fact produced by opium” (1971: 80).
working-class ganja culture obviously cannot be disassociated from
the overall social structure.

There is little if anything to indicate that extensive use of ganja
is causally related to poverty in Jamaica. High rates of unemploy-
ment and even higher rates of underemployment, debilitating
health factors such as malnutrition, yaws and intestinal parasites,
restrictions on emigration, lack of capital for small-scale investment
are all chronic conditions antedating the widespread use of ganja
in Jamaica. "Failure lies everywhere," one subject remarks, "when
the crop is scanty, work is scanty." Under the circumstances, even
though they are small-scale operations, cultivation of ganja as a
cash crop and the distribution of ganja provide welcome, if illegal
and arduous, sources of income: "The only way you can get a
penny to send the children to school."

Herbs selling is a small man's speculation - [the money] even
though small, usually come in the time of need. So is not people
love to deal with ganja so much why the average people that
deal with it deal with it. But is a necessity. The necessity is
a bigger achievement. [Even if] the fee is that small, it can
still boil a pot of porridge for five hungry children.

In fact, economic reasons are frequently given to support the
continued use of ganja. Anti-ganja legislation is sometimes seen in
terms of economic advantage: ganja is "good if sell and mek yu
get a good piece of money." For some individuals, the cultivation
of ganja may even provide enough cash for investment in small
legitimate enterprises that could not otherwise be funded.

Ganja use in many ways is central to the life style of active
participants in the ganja subculture. Acquiring and affording ganja,
anticipated beneficial effects, fear of detection and the sense of
community in sharing in an illicit activity all contribute to the
importance of ganja to the individual. Nevertheless, there are struc-
tural restraints on compulsive use. Seasonal variations, availability
of cash for purchase, on-the-job restrictions against smoking, the
intensity of police surveillance, fear of obeah and "science" and
awareness of local informers inhibit excessive use and constrain
smoking in public. In this regard, the regular ganja smoker is unlike
the alcoholic or compulsive gambler, both in terms of felt needs
and of a compulsion to invest in a "habit" regardless of consequences.
Although rum is a common working-class drink, smokers of ganja say that they "rather it to rum" and cite therapeutic, behavioral and work benefits as reasons for their choice. As contrasted with the many positive benefits of ganja, alcohol is considered harmful not only to the individual drinker but to his interpersonal relations. Given recent scientific findings on the deleterious personal and social effects of alcohol, ganja may well be "a benevolent alternative." Certainly there appears to be considerably less risk to the society of work loss from ganja than from alcohol.

Ganja smokers dispute alleged links of ganja to crime, violence and insanity, attributing antisocial behavior to underlying personality and predisposition rather than to the plant. These observations are supported by the Indian Hemp Drugs Commission Report of 1894 which noted that the effect of ganja is to bring into play the "natural disposition of the user" (Great Britain 1969: 264); more than half a century later, various researchers independently have been rediscovering some of the findings of the Commission. For example, "The underlying personality is the determining factor in criminal behavior" (Charen and Perelman 1946:676–677); and the general observation has been made by Nowlis that no "drugs, per se, produce addiction, criminal behavior, sexual excess ..." (1970–71:532).

Contrasts in reaction to cannabis are becoming apparent within Jamaica, itself, as a sociocultural phenomenon. Position in the social system is undoubtedly the single most significant variable in conditioning attitudes to ganja smoking. While members of the upper levels of the working class, particularly devout church members, share the middle-class view that ganja smoking is psychologically and physically damaging, a precipitant of violent, anti-social and "revolutionary" acts, smokers apparently agree with Brotman and Suffet that "it is not necessary to explain drug use by invoking some version of social pathology" (1971:242).

Cannabis use recently has spread to some segments of the middle class, although it is not as pervasive and it carries a different set of psychocultural expectations, such as concepts of enhancement of

3. Beaubrun (1974) cites a high correlation between extroversion and heavy drinking; with a preponderance of cyclothymic personalities who are successful in Western cultures, alcohol becomes the "establishment" choice while personality attributes in the "culture of poverty" may lead to cannabis preference.
creativity, pleasure in listening to music, escape from boredom, return to a "child-like" state of absorption in details and search for the "ultimate experience" in sex. Smoking or ingesting small amounts of ganja is reported to induce voracious hunger and to act as an instant aphrodisiac. 4

Sociocultural and individual variations in usage and reactions must be analyzed in relation to the chemical content of the cannabis and quantity consumed. 5 Working-class users regularly consume far more ganja, in all forms, for much longer periods, than middle-class users. They are also more familiar with the plant and its products in terms of quality and use the most potent grades available seasonally.

Cannabis and other drugs

Concern in the United States about allegations that there is "no doubt that marijuana has long been important in the rites of initiation to heroin use – and for a medley of other drugs" 6 do not apply to Jamaica. After a century of use of cannabis for medicinal and psychoactive purposes, Jamaican working-class users do not experiment with other drugs. Heroin and "hard" drugs, generally, are unknown in Jamaica. Amphetamines and barbiturates are rarely, if at all, used in the working class, which relies by tradition on folk medicines and has limited access to costly prescriptions or patent medicines. The few cases of heroin toxicity that had come to the attention of physicians all involved tourists. The concern that cannabis is "the half-way house to heroin" is simply not borne out by the Jamaican data.

4. Laboratory analysis of samples submitted to the Jamaica Project by several middle-class users reveal only "traces" of THC, supporting the thesis that psycho-cultural expectations condition individual reactions to cannabis.

5. Reports on the potency of plant samples submitted by the subjects, assayed in NIMH laboratories in the United States, and project data on quantity and frequency of use are included in Appendices III and IV.

6. See discussion by Brill in symposium on "Drug Abuse: Legal and Ethical Implications of the Non-Medicinal Use of Hallucinogenic and Narcotic Drugs" (1968: 80–81). See also Nahas (1973: 285) on cannabis and multiple-drug use: "All available evidence indicates that regular Cannabis consumption conditions the user psychologically as well as pharmacologically to the use of other mind-altering drugs."
**Implications for the future**

Data from the research project suggest that Jamaicans are starting to smoke *ganja* regularly at younger ages than in the past. Taking this trend into account, along with the increase in life expectancy over the past few decades given in Appendix VIII, an increase in the average number of years of regular use can be expected in the future. Despite the array of formal and informal sanctions against *ganja*, its use has been increasing in the working classes and is spreading to other sections of the population. There appears to be every likelihood that this diffusion will continue. In due course, *ganja* may have as widespread a distribution as tobacco and alcohol.

**Summary**

Judging from the clinical data, the physical risk to the individual appears to relate primarily to *smoking per se*, given long-term chronic smoking of *ganja* mixed with regular tobacco, in spliffs and chillum pipes, in addition to heavy consumption of regular tobacco cigarettes. The only significant medical differences between smokers and non-smokers were differences in statistical trends in lung function and hematology. Kalant and Kalant (1968) point out that respiratory consequences correlated with chronic cannabis smoking may be due to smoke components unrelated to the psychoactive properties. While more clinical research is required to follow up these leads and, if possible, to isolate the effects of tobacco smoking from the effects of cannabis-tobacco smoking, at present it appears that the risk of chronic cannabis smoking may parallel the risks of chronic tobacco smoking.

The psychiatric findings do not bear out any of the extreme allegations about the deleterious effects of chronic use of cannabis on sanity, cerebral atrophy, brain damage or personality deterioration. There is no evidence of withdrawal symptoms or reports of severe overdose reactions or of physical dependence. The psycho-

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7. The U.S. DHEW report notes that “Death from an overdose of cannabis is apparently extremely rare and difficult to confirm” (1972:13). The matter of “lethal overdosage” of marihuana is undoubtedly extremely rare; as Weil observes: “On the basis of experiments in cats, one can estimate (roughly) that a possible lethal dose of marijuana for a person of average weight would be a pound and a half taken as a single oral dose.” No such heroic dosages have been reported in
logical findings show no significant differences between long-term smokers and non-smokers.

Over the past one hundred years, the ganja complex has developed and proliferated in Jamaican society and is extraordinarily well integrated into working-class life styles. Ganja serves multiple purposes that are essentially pragmatic, rather than psychedelic: working-class users smoke ganja to support rational task-oriented behavior, to keep “conscious,” fortify health, maintain peer group relations and enhance religious and philosophical contemplation. They express social rather than hedonistic motivations for smoking. Ganja as an energizer is the primary motivation given for continued use. The concern of many in the United States that marihuana creates an “amotivational syndrome” and a “reduction of the work drive” is not borne out by the life histories of Jamaican working-class subjects or by objective measurements, which indicate that acute effects may alter the rate and organization of movement and the expenditure of energy during work, but that heavy use of ganja does not diminish work drive or the work ethic.

There is no evidence of any causal relationship between cannabis use and mental deterioration, insanity, violence or poverty; or that widespread cannabis use in Jamaica produces an apathetic, indolent class of people. In fact, the ganja complex provides an adaptive mechanism by which many Jamaicans cope with limited life chances in a harsh environment. Legislative repeal of the mandatory sentence for possession, following the presentation of the ganja report to the Jamaican Government, was a major step in the decriminalization of a traditional cultural practice that goes back to remote horizons.

The failure of policy makers to realize the importance of informal

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8. The Canadian Commission, for example, reports that: “the simple pleasure of the experience” appears to be a major factor in cannabis use among students and adults as “part of a largely hedonistic life style in which happiness and pleasure are taken as self-evidently valid goals of human life.” The Report notes that this is not a trivial motivation; “it is an old and universal theme of human history. Man has always sought gratifications of the kind afforded by the psychotropic drugs” (Canada 1970: 160, 155–56).
social controls in preventing drug abuse is beginning to be recognized. Michael Sonnenreich, Vice-President of the National Coordinating Council on Drug Education in the United States, observed that drug-taking is socially controlled “when it is routinized, ritualized and structured so as to reduce to a minimum any drug-taking behavior which the surrounding culture considers inadvisable. From this analysis there should follow a new approach” (*ICAANews* 1974:5). The multidisciplinary findings reported in this volume highlight the underlying role of culture in regulating the use of *ganja* and conditioning reactions to it — within a structured system of social controls.
Appendices
APPENDIX I. "Ganja Smoking as a Danger to the Natives of this Colony"
(Editable from Daily Gleaner, Jamaica, June 10, 1913)

Rumour has it that the growth of the ganja smoking habit in one of the northside parishes and particularly St. Mary is causing considerable concern to the indentured coolies brought out from India; but it has since spread to some of the ruling authorities at present. The habit was at first confined to the natives of the colony; and it is that aspect of the matter which is now beginning to create anxiety in the minds of many influential men and observant officials. That ganja smoking is a most pernicious and demoralising practice, all who have observed its effects will readily admit. We have seen a coolie gardener - by nature a quiet, retiring man - behaving like a raving maniac while under the influence of the weed. And we have seen other equally amiable, inoffensive East Indians labouring under intense excitement - talking volubly, gesticulating wildly, with flashing eyes and quivering nerves - from the same causes. Naturally a poison so powerful affects the brain of every victim of the habit and gradually deprives him of all moral sense; and it is a well known fact that a large percentage of the murders committed by imported coolies has been directly traceable to the excessive use of ganja as a substitute for tobacco. If the habit is now becoming acquired by natives in any appreciable numbers, we can quite understand the perturbation of mind which the latest development is producing in certain circles. There is no reason to suppose that the influence of the weed will be any less deleterious in the case of people of African descent than it has proven itself to be in the case of people of East Indian lineage. Indeed if the teachings of science count for anything, ganja-smoking is likely to have an infinitely worse effect on the nerve systems of people entirely unacquainted with and entirely unaccustomed to the poison, than it has on the descendants of men who for centuries have been familiar with its use, if not abuse. That being so, Jamaica will have paid dearly for its coolie labour, if an additional and utterly demoralising vice has secured a firm lodgment among the humbler orders of the island, as a result of the importation of Indian field workers, addicted to so pernicious a habit. And if there is evidence (as we are told there is) that native cultivators are now beginning to grow ganja in increasing quantities - are now taking to the smoking of the weed in increasing numbers - exhibit the symptoms characteristic of confirmed victims of the habit - should not now the question of prohibiting the cultivation and importation of ganja be faced seriously and earnestly by the Government of the colony with the least possible delay? We all know what mischief opium smoking has done in China and other countries - mischief for which, alas, the British authorities must be held very largely responsible. And we all know that the only panacea for the evil yet discovered has been - prohibition. For every man who falls a victim to the drink craze,
there are hundreds of thousands of men who can use alcohol in one form or another without abusing it. And we see neither right nor reason in maintaining the principle (?) that because one man in a thousand becomes a drunkard, therefore the other nine hundred and ninety-nine men should be prevented from drinking a glass of wine. With such a mental attitude we have not a particle of sympathy. But when we come to such things as opium and ganja, an entirely different set of conditions seem to prevail. It appears to be almost impossible to use these poisons without abusing them; and the influence they exert on the character, tone and health of their unfortunate victims is demoralising and deplorable in the extreme. The opium habit is comparatively little known here. Opium is not grown and manufactured in Jamaica and the price of the drug practically places it beyond the reach of the working classes. But ganja is cultivated in many parts of this island, and its cultivation is said to be spreading at an alarming rate. Moreover, the dried or prepared weed is so cheap as to be within the reach of the very poorest labourer in the country. Under these conditions, does not a great responsibility rest upon the Government — especially if it be true that natives are now succumbing to the vile and deadly habit? Why not forbid the cultivation of the plant absolutely? Why not destroy every patch of it that is discovered? And if it be not deemed advisable to prohibit the importation of the increasingly popular "smoking mixture", why not place such a heavy import duty on it that ordinary persons could only afford the luxury of a whiff at rare and irregular intervals?
APPENDIX II. Summary of *ganja* legislation in Jamaica, 1913–1972

<table>
<thead>
<tr>
<th>Date</th>
<th>Penalties</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913 Ratification of International Opium Convention</td>
<td>Cultivation and importation punishable by fine of up to £ 100 or prison up to twelve months.</td>
<td>Jamaica adds prohibitions against <em>Cannabis sativa</em> to the Opium Convention</td>
</tr>
<tr>
<td>1924 Dangerous Drugs Law</td>
<td>First conviction for cultivation, possession, sale or smoking – up to six months in prison and/or fine up to £ 100.</td>
<td>Increased penalties for use of opium or <em>ganja</em>.</td>
</tr>
<tr>
<td>1941 Dangerous Drugs Law amended</td>
<td>First conviction: mandatory imprisonment of up to one year, with possibility of fine up to £ 100. Second conviction: mandatory imprisonment of up to two years, with possibility of fine up to £ 250.</td>
<td>Increased penalties for possession, sale or cultivation of <em>ganja</em>. Mandatory imprisonment decreed for first time.</td>
</tr>
<tr>
<td>1948 Dangerous Drugs and Law amended 1954</td>
<td>Smoking penalties the same.</td>
<td>Blanketed all forms of possession and sale, distinguishing between these offenses and smoking.</td>
</tr>
<tr>
<td>1961 Dangerous Drugs Law amended</td>
<td>For growing, selling or otherwise dealing in <em>ganja</em>, mandatory imprisonment of up to five years, with possibility of unlimited fine. For possession and smoking, penalties remained the same.</td>
<td>Increased penalties for growing, selling and dealing.</td>
</tr>
<tr>
<td>Date</td>
<td>Penalties</td>
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<td>------------</td>
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<tr>
<td>1964</td>
<td><strong>Dangerous Drugs Law amended</strong></td>
<td><strong>Increased mandatory imprisonment for first conviction for possession.</strong></td>
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<td></td>
<td>First conviction for possession: minimum imprisonment of 18 months, maximum three years, without option of fine.</td>
<td><strong>Gave police powers of search on authority of a sergeant instead of a magistrate’s warrant.</strong></td>
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<td></td>
<td>Second conviction: three years minimum, five years maximum.</td>
<td><strong>An offense to allow premises to be used for cultivating or using ganja.</strong></td>
</tr>
<tr>
<td></td>
<td>First conviction for allowing premises to be used for cultivating or using ganja: imprisonment up to 12 months or fine or both.</td>
<td><strong>Empowered police to seize vehicles suspected of carrying ganja.</strong></td>
</tr>
<tr>
<td></td>
<td>Second conviction: imprisonment up to two years or fine or both.</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td><strong>Dangerous Drugs Law amended</strong></td>
<td><strong>Repealed the mandatory provisions of the earlier legislation by giving the courts discretionary power in sentencing.</strong></td>
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<tr>
<td></td>
<td>First conviction for cultivating, selling or dealing: fine not exceeding $2,000 or imprisonment up to seven years or both.</td>
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<td></td>
<td>Subsequent convictions liable to fine not exceeding $5,000 or imprisonment up to ten years or both.</td>
<td></td>
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<tr>
<td></td>
<td>First conviction for possession: fine not exceeding $1,000 or imprisonment up to three years or both.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subsequent convictions liable to fine not exceeding $2,000 or to imprisonment up to five years or both.</td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX III. Laboratory analyses of ganja samples

(For laboratory analysis: each subject in the clinical smoker group was asked to provide two samples of the type of ganja used)

<table>
<thead>
<tr>
<th>Subject</th>
<th>( \Delta^8)-THC</th>
<th>( \Delta^9)-THC</th>
<th>Cannabinol</th>
<th>Cannabidiol</th>
<th>Mean percent by weight found</th>
</tr>
</thead>
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<tr>
<td># 1</td>
<td>0.06</td>
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<td>0.2</td>
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<td>Subject</td>
<td>Percent by weight found</td>
<td>Mean percent by weight found</td>
<td></td>
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<td></td>
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<td>---------</td>
<td>-------------------------</td>
<td>-----------------------------</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta^8$-THC</td>
<td>$\Delta^9$-THC</td>
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<td>Cannabidiol</td>
<td>$\Delta^8$-THC</td>
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<td>0.2</td>
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<td>2.1</td>
<td>0.6</td>
<td>0.2</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Subject</td>
<td>$\Delta^8$-THC</td>
<td>$\Delta^9$-THC</td>
<td>Cannabinol</td>
<td>Cannabidiol</td>
<td>$\Delta^8$-THC</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>---------------</td>
<td>------------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
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<td>2.6</td>
<td>0.7</td>
<td>0.3</td>
<td>0.2</td>
</tr>
</tbody>
</table>

ND = None detected.

* 1 sample submitted by 2 subjects
APPENDIX IV. Demographic profile of clinical sample based on life histories

*Age and family background*

The average age of subjects in the sample was 34 years, the range being 23–53 years. Eleven smokers and 10 controls (35%) were urban dwellers; 14 smokers and 15 controls (48%) were rural; and 5 smokers and 5 controls (17%) were from coastal areas. There was a tendency toward urban migration; only 9 persons (15%) of the entire sample had been brought up in an urban area.

Thirteen respondents (22%) reported the father as principal supporter during childhood; 11 (18%) were supported solely by their mothers; 17 persons (28%) reported that both parents were gainfully employed or "own account" (self-employed); the remaining 19 (38%) were supported by maternal relatives, siblings or by other kinfolk and friends.

Almost half of the subjects (49% of the 55 who replied to the question) reported their parents were legally married; the parents of 5 were in a common-law relationship; the parents of 12 (22%) were unmarried; and one respondent did not know the marital status of his parents. The total number of persons in the subjects' family of orientation (which includes persons living in the same yard and sharing food) ranged from 2 to 16. Thirteen subjects (22%) were first-born. There were no significant differences between smokers and controls on these variables of family background.

*Education*

Eight respondents (14%) had completed less than one year of formal education. Years of schooling completed for the other 52 subjects ranged from 1 to 9 years. The mean number of years completed was 4.5. There were no significant differences between smokers and controls on years of school attendance. Years of schooling does not accurately reflect the standard or grade level obtained. The standards completed ranged from none to sixth grade; the mean number of standards attained was 3.0. There were no differences between smokers and controls on this variable.

*Occupational history*

Twenty-four subjects (48%) had worked as apprentices without pay or at wage jobs as children. Most of the respondents (64%) worked with their fathers or male head of household during childhood.

The primary occupation of subjects in the sample at the time of the study was as follows:
<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total</th>
<th>Smokers</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>21 (35%)</td>
<td>9 (30%)</td>
<td>12 (40%)</td>
</tr>
<tr>
<td>Fishermen</td>
<td>12 (20%)</td>
<td>8 (27%)</td>
<td>4 (13%)</td>
</tr>
<tr>
<td>Skilled jobs</td>
<td>10 (17%)</td>
<td>3 (10%)</td>
<td>7 (23%)</td>
</tr>
<tr>
<td>(masons, carpenters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-skilled</td>
<td>8 (13%)</td>
<td>4 (15%)</td>
<td>4 (13%)</td>
</tr>
<tr>
<td>Produce vendors</td>
<td>3 (5%)</td>
<td>0 (0%)</td>
<td>3 (10%)</td>
</tr>
<tr>
<td>Ganja vendors</td>
<td>2 (3%)</td>
<td>2 (7%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>&quot;Scuffling&quot; (odd jobs)</td>
<td>4 (7%)</td>
<td>4 (15%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>60 (100%)</td>
<td>30 (100%)</td>
<td>30 (99%)</td>
</tr>
</tbody>
</table>

* Figures add to 99% as fractional percentages were not included.

As is characteristic in the Jamaican working class, most subjects had a history of jobs in different occupational categories and/or multiple jobs in order to support themselves and dependents. Total percentages of subjects who at one time held any of the occupations are listed below:

**Past occupations:**

- Farming: 76%
- Fishing: 49%
- Vending: 33%
- Ganja vendor: 29%
- Skilled work: 34%
- Semi-skilled work: 68%
- "Scuffling" (odd jobs): 50% (periodically)
- Unemployed: 59%

Smokers were more likely to have had work experience as fishermen (p = .117, df = 9), and more likely to have been involved in ganja vending (p = .064, df = 1). Eleven smokers had been ganja dealers in the past. Three controls reported past ganja activity "to raise a penny to send the children to school." Controls were more likely to have had some skilled jobs (p = .122, df = 1); they were also less likely to have ever been unemployed (p = .290, df = 27). This is probably due to the somewhat higher incidence of apprenticeship among the controls; 14 controls and 10 smokers were apprentices; an additional 4 smokers had received some "job training" in approved schools (p = .002, df = 3). The reason for higher incidence of apprenticeship among controls could not be determined from other life history data. There were no other differences between smokers and controls on occupational history.

**Job changes**

Percentages and reasons for job changes by smoker/control during past five jobs are presented below:
Smokers and controls had similar reasons for job changes. Controls were slightly more inclined to report that they changed jobs to better themselves, and smokers were more likely to say they quit because they disliked the job or their co-workers. These differences, however, are not statistically significant.

**Property ownership**

Ownership of houses, vehicles and land was more common among rural dwellers. Fourteen (26%) of the subjects owned land, 10 (19%) had access to family land and 8 (15%) rented or leased land. Thirty respondents (50% of the sample) were in a position to grow a cash crop.

Of 39 subjects who reported on house ownership, 2 subjects (5%) owned 2 houses each; 13 (33%) owned one house, 10 (26%) lived in family-owned houses and 14 (36%) reported no house ownership. Slightly more controls than smokers had access to houses. Differences were due mainly to family house ownership; 8 controls and 2 smokers lived in family-owned houses.

Seven of the subjects were owners of fishing boats and 9 owned their own fishing pots. Controls were more likely than smokers to own fishing boats (5 of 7 boat owners were controls). Smokers were more likely to own fishing pots (7 of 9 pot-owners were smokers). These differences are not significant.

Only 8 persons in the sample had access to vehicles; 3 of these were job related vehicles. One subject, a *ganja* cultivator, owned both a truck and a car. There is no statistical difference between smokers and controls on this measure.

**Income**

Annual cash earnings were difficult to determine, due to seasonal and market variations in earnings and to job changes. Current weekly income was used as a ranking measure: 24 subjects (40%) were ranked in the low group of earnings per week; 13 (22%) in the medium range; and 15 (25%) in the high weekly earnings group. Eight persons (13%) had either
non-existent or very meager cash income at the time of the study. Comparison of smokers with controls indicates that almost exact matching of a smoker with a control could have been done on the basis of cash income levels alone. Eighteen subjects (30% of the sample) reported contributing goods, food, labor and/or cash to their family of orientation. Almost an equal number received similar types of support from their families. Twelve persons (20% of the sample) were also provided with family housing and assistance with child care.

Marital alliances
The total number of past alliances ranged from 1 to 10, correlating with the age of the subject. The age at which first “visiting” alliances were reported ranged from 12 to 25 years, and first “living with” alliances from 16 to 32 years. The age at which common-law alliances were established or legal marriage took place ranged from 22 to 27 years. Twenty-three subjects (39%) had not yet established a “living with” or permanent relationship. The average number of children (through any alliance) for the sample was 4, with a range of 0–14. Present household size ranged from one (self) to 14 members. There were no significant differences between smokers and controls on history of marital alliances. The findings reflect Jamaican working class patterns of mating and marital alliances.

Religious affiliation and church attendance
Thirty-two subjects (53%) reported no church affiliation; 8 (12%) were in Protestant-Fundamentalist groups; 5 (9%) were Baptists; and 2 (4%) were affiliated with Pentecostal denominations. Eight (12%) of the subjects were Ethiopian Orthodox or Rastafarian. Controls tended to belong to denominations generally antagonistic to ganja use. Nine controls as against 5 smokers were Protestant-Fundamentalists, Baptists or Roman Catholic. The 8 subjects of Ethiopian Orthodox or Rastafari persuasion (groups that espouse the use of ganja) were all smokers.

Political party membership and voting behavior
Information on political party membership and participation was difficult to obtain. Specifically subjects were reluctant to discuss matters that might affect job possibilities. Forty-eight (84%) of 57 subjects claimed no political party affiliation; of 56 subjects responding, 31 (55%) had voted in the last election and 27 (48%) indicated they were planning to vote in the coming election. Thirty-six of 55 respondents said they felt that voting could not improve their situation or that they felt apathetic about voting. There are no statistically significant differences between smokers and controls on political attitudes or degree of participation in political parties. The findings reflect working-class attitudes applicable to both smokers and controls.

Other organizations
Very few of the subjects had formal organizational affiliations; 5 were
members of the Jamaican Agricultural Society (JAS), and 2 were members of the Parents-Teachers Association (PTA). The fishermen belonged to fishing cooperatives. Only 25% of the subjects ever attended organizational meetings.

Age of first ganja experience and age regular smoking commenced
Age of subjects at first experience ranged from 8 to 36 years. Smokers tended to have their first experience earlier than controls. All smokers had smoked ganja before the age of 20 as contrasted with the controls of whom 9 first smoked ganja before age 20. Nine controls had their first experience after the age of 20, and 12 reported having no experience. The difference was significant (p = .006). The age regular use began ranged from 9 to 25 years; the average was 15 years. Thus an earlier experience with ganja may be considered predictive of later regular use.

Introduction to ganja smoking
In 32 cases (67% of 48 subjects who had a first experience), subjects were introduced to the first experience by a peer, usually somewhat older. In 4 (7%) of the cases, the father introduced the subject to ganja smoking and in another 4 (7%) an older sibling introduced the respondent to his first experience. Only 3 persons (6%) were introduced to ganja by a dealer. The person who introduced the respondent to his first smoke was not predictive of smoker or control status of the respondent.

Setting of first ganja smoke
The setting of the first smoke was usually "in the bush" or "gully" (19 cases; 40%) or "on the riverbank," in the field or other job-connected setting (11 cases; 23%). The next most prevalent setting for the first ganja smoke was in the house or yard of the subject (10 cases; 21%).

Motivation for first ganja smoke
The primary motivation for the initial smoking experience was curiosity (31 cases; 65% of 48). The remaining 17 subjects gave no specific reason for trying ganja. Peer pressure was reported by 5 subjects, and 2 mentioned they felt it was a symbol of "manship." Smokers were more likely to express curiosity (23 of the 31 cases were smokers), peer pressure (4 of 5 cases) or a feeling of rite de passage (2 of 2 cases). Only 11 of 48 subjects reported that any verbal instructions were given on how to light, hold or inhale the spliff.

Reasons for not smoking ganja
The most prevalent reason given by the controls for not smoking was fear of legal consequences and the resulting social stigma. This was mentioned by 18 (60%) of the 30 controls; other reasons cited in decreasing incidence were: family did not smoke; economic factors; "no appeal"; subject does not smoke (tobacco) at all; had bad first ganja experience; "fear of mad"; health reasons.
Present ganja use: Quantity
The number of spliffs reported by smoking subjects at the time of interview ranged from 2 to 3 times a week to as many as 24 per day. The higher figures were approximated by 3 smokers who chain smoke and do not count the actual number smoked per day. The average number of spliffs smoked per day was probably 7 at the time of the study. On the basis of the frequency count, low usage (use by 1/3 of the smoking sample) is defined as 4 spliffs or less per day; moderate use is defined as 5 to 8 spliffs per day; and heavy use as over 8 spliffs per day. One subject used the chillum pipe exclusively; 7 smokers used only spliffs. The number of pipes smoked per week ranged from 1 to 24, with 14 pipes per week as the average smoked.

Duration of ganja smoking
Onset of regular smoking was usually several years after the first experience, when economic self-sufficiency was established. One smoker reported smoking regularly for 7 years, and another for 8 years at the time of the interviews. One smoker did not recall the age at which regular smoking started, and data on another smoker was too vague to calculate. Of the 24 smokers asked about continuity, 20 reported they had never discontinued since regular use started; 4 subjects had discontinued use at various times in the past due to economic circumstances. The average number of years smoked, based on 28 cases, is 17.5; range was 7 to 37 years of use.

Twelve smokers (40%) reported increased use since their first smoking experience, the present smoking level having been reached with present earning level. Seven smokers (23%) reported no change in the quantity smoked, and 2 smokers (7%) reported a decrease. There is no data on 9 smokers on this variable. Twenty-seven of the ganja smokers also smoked tobacco cigarettes regularly, as did 19 of the controls, while 11 of the controls did not smoke at all.

Methods of ganja use
All 30 smokers mix tobacco with ganja for both spliffs and pipe, to give "a better smoke." Only 11 subjects (37%) had ever smoked ganja unmixed with tobacco. This is not a common practice. The subjects who did not use the pipe felt it is too much trouble, too easily detected, or disliked the deep-breathing associated with pipe smoking, which makes them cough. Twenty-nine (97%) of the smokers also take ganja tea. Although this question was not specifically asked of the controls, it is believed that they also take tea occasionally. Smokers also reported use of ganja medicinally and in the dietary as a vegetable.

Most subjects (53%) prefer to smoke the spliff and most prefer kali, the most potent grade of ganja. All grades, however, are smoked, as they become available seasonally and financially.
Ganja smoking settings
Preferred settings for smoking *ganja* are generally those where there is minimal chance of detection and where the ambiance is agreeable; at the home or yard of the subject or a friend, the bush or riverbank and/or at work. Twenty-two smokers (73%) reported that they exercise caution when purchasing *ganja* and 24 (80%) that they exercise caution when smoking. Fewer reported fear of being caught (57%). Solitary smoking is not customary. Although 25 subjects (83%) smoked alone (usually in the morning or before bedtime), only 8 smokers (27%) said they prefer to smoke alone; eighteen subjects (60%) habitually smoked with peers.

Perceived effects
Most smokers perceive no harmful effects of *ganja*. Even non-smokers believe that *ganja* teas and tonics have therapeutic properties. Only 6 persons (10%) in the sample stated categorically that *ganja* serves no useful purpose. Medicinal uses cited include treatment of asthma, colds, stomach disorder, marasmus, fevers, rheumatism, "to make blood stronger," 37 additional ailments and general prophylaxis.

Ganja smoker networks
*Ganja* smoking by friends and peers is accepted by non-smokers. Although smokers tend to have more smoking acquaintances, controls reported no negative feelings about smoking peers. Eleven (18%) of the subjects reported that their mate smokes and 14 (23%) that close relatives or parents smoke. Thirty-nine subjects (65%) reported that some of their co-workers smoke, and they actively participate in networks of habitual smokers. Church sanctions against *ganja* smoking seem to exert little influence on smokers who are church members.

The only departure from acceptance of *ganja* smoking involved attitudes toward use by children. Twenty-seven of the 60 subjects (45%) were opposed to smoking by their children, for legal and/or economic reasons, or that "they would not have the head for it" because of their age; 3 subjects (5%) were opposed to smoking by children on moral grounds.

Alcohol consumption
There was a tendency for smokers to drink less than non-smokers ($p = .129, df = 3$). Of 55 subjects questioned about alcohol consumption, 24 persons (45%) reported occasional or no drinking, 23 (42%) were moderate drinkers and 8 (15%) were heavy drinkers; of these heavy drinkers, 6 are controls and 2 are smokers. The primary setting for drinking is at local bars, frequented especially on weekends.

Attitudes toward alcohol and ganja consumption
The effects of drinking were viewed more negatively than those of smoking *ganja*. Of 42 subjects who gave their opinions on alcohol consumption, 12 reported that alcohol made them feel more "sociable,"
18 said that alcohol made them excited, 8 that drinking made them violent or irresponsible, 7 that it made them feel weak and 5 that it was generally bad. More than 100% is accounted for by multiple opinions.

Of 27 smokers asked about alcohol/ganja preference, 25 preferred ganja to alcohol, one had no opinion and one preferred alcohol. The major reason given for this preference was that ganja enables them to do their work and is not socially disruptive. Some added that it costs less than alcohol.

Ganja and crime
Twenty-six (57%) of 46 subjects who were asked about the relationship between ganja and crime stated there is none; an additional 14 persons (30%) affirmed that criminal behavior depends on the predisposition of the individual. Only 5 subjects (11%) perceived a relationship between crime and ganja use, and one of these respondents (a smoker) felt it led to a decrease in criminal activity. One subject had no opinion.

Legal charges
Twenty-eight (47%) of all respondents had a past record of charges, ranging from traffic violations and "abusive language" to possession of ganja and fighting. Misdemeanor charges were the most common. There were no differences between smokers and controls in total number of charges. However, 6 controls as opposed to 3 smokers had been charged with crimes of violence, 5 smokers had been picked up for possession of ganja and one control had been mistakenly arrested for the same charge. Deleting ganja charges, smokers exhibited less "criminal activity" than controls.
APPENDIX V. Chromosome studies, steroid excretion and peripheral thyroid hormone levels

Chromosome studies

Methodology. The chromosome studies were performed by the micro-technique of Arakaki and Sparkes, using whole blood withdrawn by venepuncture at approximately 9 A.M. on the morning after admission to the hospital. The blood was cultured at 37°C. in Eagles medium with 15 percent calf serum and phytohemagglutinin for 48 hours. Coleimid exposure was given for the last one and a half hours of culture. Cell suspensions were exposed to hypotonic treatment and fixed in Methanol-acetic acid, 3:1. Smears were flame-dried and stained by Giemsa. Twenty-five good mitotic spreads from each subject were examined under oil immersion. The chromosomes were analyzed by groups and screened for any numerical or structural abnormality, particularly breaks and gaps, abnormal formations and exchanges.

Results. Twenty-seven cultures from 12 smokers and 15 controls failed to produce adequate results for analysis, partly because of a bad batch of calf serum. The results in the 33 successful cultures — 18 from smokers, 15 from controls — are shown in the accompanying Table 1. The cells were pooled, giving totals of 381 and 341 cells analyzed for smokers and controls, respectively. Chromatid breaks and gaps were the only abnormalities found, except in one case where there were two additional D autosomes in one cell. The breaks and gaps occurred in 2.36 percent of cells in smokers and in 2.90 percent in controls, a difference that is not statistically significant. No abnormal configurations, exchanges or dicentrics were seen.

Conclusions. Chronic cannabis smoking appears to have no significant effect on the mitotic chromosomes of human peripheral blood lymphocytes in the Jamaican male. The incidence of mild chromatid breakage — 2.36 percent (smokers) and 2.90 percent (controls) — was no higher than that found randomly in other studies at the University.

These findings lend no support to the recent allegation that "chromosome damage... even in those who use cannabis 'moderately' is roughly the same type and degree of damage as in persons surviving atom bombing with a heavy level of radiation exposure (approximately 150 Roentgens). The implications are the same" (Associated Press release May 20, 1974, Senate Internal Security Subcommittee).

Steroid excretion study

The excretion of a number of urinary steroids in the chronic smokers and matched controls was studied for indications of marked changes in adrenal cortical function in the smokers. Smokers and controls were compared for urinary metabolites of cortisol, the main corticosteroid
secreted by the adrenal gland. Such comparisons could reveal major
damage to adrenal cortical function, though the changes would have to
be marked to affect cortisol secretion significantly.

Methodology. Twenty-four-hour samples of urine were collected under
controlled conditions, while the subjects were in University Hospital.
The specimens, adjusted to pH 5.2 and pasteurized, were immediately
shipped to Rockland State Hospital Research Center in New York,
arriving there two to three days after collection.

Results. Both average creatinine and steroid values were lower than
values in the New York area (probably to a large extent due to differ-
ences in body size and weight). No differences were found between the
two Jamaican groups, either by t-test or by non-parametric statistical
tests (Tables 2 and 3).

Discussion. These results would indicate that there is no significant re-
duction in cortisol secretion in the group of chronic cannabis smokers
when compared with a matched group of non-smokers. This was a crude
measure of adrenal function; more subtle methods of testing might reveal
differences. Future work ought to include ACTH and metapyrone tests
and should be undertaken specifically to test adrenal function. A study of
gonadal hormones and pituitary hormones might be more satisfactory.

Peripheral thyroid hormone levels
Serum samples from 22 subjects – 15 smokers and seven controls – were
frozen and sent to the Rockland State Hospital. Total thyroxine and free
thyroxine content were determined, using the methods of Pileggi et al.
(1961) and Oppenheimer et al. (1963), respectively. The data are shown
in Table 4.

Analysis of these data by the Mann-Whitney U Test (two tail)
produced the following results:

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</table>

Discussion. The two groups do not differ from one another, and therefore
chronic smoking cannabis did not affect these indices. Five subjects
had lower diffusible fractions (resulting in lower free thyroxine level)
than normally encountered in the New York population, and there is a
generally lower free thyroxine level in the group as a whole.
Table 1. Analysis of 33 cases in which chromosome studies were successful

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<td>No. of breaks and gaps</td>
<td>% of cells with breaks and gaps</td>
<td>Case no.</td>
<td>No. of cells analyzed</td>
<td>No. of cells with breaks and gaps</td>
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Total no. of cases: 18
No. of cells analyzed: 381
% of cells with breaks and gaps: 2.36
* No. of cells with breaks: 3
  No. of cells with gaps: 7
Total breaks and gaps: 10

+ This subject had one cell with 48 chromosomes (2 extra D's).

Total no. of controls: 15
No. of cells analyzed: 341
% of cells with breaks and gaps: 2.90
* No. of cells with breaks: 5
  No. of cells with gaps: 5
Total breaks and gaps: 10
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Mean 1.48 1.92 1.32 1.40 0.18 0.19 0.52 0.67 0.48 0.56 1.04 1.25 0.25 0.30 0.24 0.19 5.4 6.2

Statistical significance N.S. N.S. N.S. N.S. N.S. N.S. N.S. N.S. N.S.
Table 3. 24 hour excretion of steroids in matched controls and chronic cannabis users

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<th>Creatinine g/24 hrs</th>
<th>Total 17-Ketosteroids mg/24 hrs</th>
<th>Total 17-OH corticosteroids mg/24 hrs</th>
<th>Dehydroepiandrosterone microgr./24 hrs</th>
<th>Androsterone microgr./24 hrs</th>
<th>Etiocholanolone microgr./24 hrs</th>
<th>11-hydroxy Androsterone microgr./24 hrs</th>
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Mean 1.51 1.48 7.1 7.4 7.7 7.4 1162 1236 2477 2775 2807 2903 673 640 341 410 359 394

Statistical sign.

N.S.  N.S.  N.S.  N.S.  N.S.  1  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.  N.S.
### Table 4.

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* T = Test  
* C = Control
APPENDIX VI. Estimated THC content of cannabis used in the U.S. and other countries
(Adapted from McGlothin 1974)

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<th>Conditions of use</th>
<th>Est. mg. THC</th>
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<td>Experimental data</td>
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<tr>
<td>Single dose</td>
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<td>Max. exper. dose normally given by smoking in U.S.</td>
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<tr>
<td>Dose given chronic hashish users in Greece</td>
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<tr>
<td>Ad lib.; avg./day</td>
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<tr>
<td>U.S. 1946 (39 days)</td>
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<tr>
<td>U.S. 1971; casual users (21 days)</td>
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<tr>
<td>U.S. 1971; daily users (21 days)</td>
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<tr>
<td>Greece 1970 (30 days)</td>
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Survey or other reports

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<th>Amount/day: typical user</th>
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<td>Current U.S. (occas. users)</td>
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</tr>
<tr>
<td>Current U.S. (daily users)</td>
<td></td>
</tr>
<tr>
<td>U.S. (1940, daily users)</td>
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<tr>
<td>Egypt</td>
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<tr>
<td>Morocco</td>
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<tr>
<td>India</td>
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</table>

<table>
<thead>
<tr>
<th>Amount/day: heavy users</th>
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<td>Current U.S. (daily users)</td>
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<tr>
<td>U.S. military in Germany</td>
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<tr>
<td>Egypt</td>
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<td>Morocco</td>
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<tr>
<td>India</td>
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<tr>
<td>Jamaica</td>
<td>(\approx420)</td>
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APPENDIX VII. Responses to questions concerning reactions to first experience with ganja

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<th>Question</th>
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<th>No</th>
<th>Don't remember/ Other</th>
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<tr>
<td>Did it make you feel hungry?</td>
<td>24</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>(&quot;open your appetite&quot;)</td>
<td></td>
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<tr>
<td>Did it make you feel dizzy?</td>
<td>10</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Did it have any effect on your sight?</td>
<td>11</td>
<td>29</td>
<td></td>
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<tr>
<td>(awareness of natural phenomenon)</td>
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<td></td>
<td></td>
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<tr>
<td>Did it have any effect on your hearing?</td>
<td>6</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>(awareness of natural phenomenon)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Did you smell things any differently?</td>
<td>3</td>
<td>34</td>
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</tr>
<tr>
<td>Did it make you feel thirsty?</td>
<td>20</td>
<td>22</td>
<td></td>
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<tr>
<td>Did it make you feel aggressive?</td>
<td>1</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>(violent, &quot;vexed&quot;)</td>
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<td></td>
<td></td>
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<tr>
<td>Did it affect your speech in any way?</td>
<td>2</td>
<td>34</td>
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<tr>
<td>Did it make you perspire?</td>
<td>4</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Did it make you spit?</td>
<td>6</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>Did it make you urinate?</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Did it give you bowel action (diarrhea)?</td>
<td>1</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Did it affect your sex drive?</td>
<td>6</td>
<td>26</td>
<td>3***</td>
</tr>
<tr>
<td>Did it make you dream/have a vision?</td>
<td>5</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Did it make you sociable/feel like talking?</td>
<td>19</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Did it make you concentrate?</td>
<td>17</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>(feel &quot;conscious&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did it make you meditate?</td>
<td>21</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Did it give you a headache?</td>
<td>0</td>
<td>38</td>
<td></td>
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<tr>
<td>Did it make you think the time was longer or shorter?</td>
<td>4</td>
<td>28</td>
<td></td>
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<tr>
<td>Did it make you feel merry?</td>
<td>24</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>(giving &quot;jokes&quot;)</td>
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<td></td>
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<tr>
<td>Did it make you feel relaxed?</td>
<td>17</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Did you have &quot;fear of mad&quot;?</td>
<td>5</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Did it affect your sexual performance?</td>
<td>0</td>
<td>23</td>
<td>3***</td>
</tr>
<tr>
<td>Did it make you feel sad?</td>
<td>2</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Did it make things taste different?</td>
<td>12</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>(more enjoyable)</td>
<td></td>
<td></td>
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</table>

* Subjects responded to question as "dryness of throat."
** Did you experience difficulty in speech, as with drinking?
*** "Too young to 'feel that'."
Responses to questions concerning reactions to subsequent experiences with ganja (smokers only)

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<thead>
<tr>
<th>Question</th>
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<th>No</th>
<th>Situational†</th>
<th>Reaction depends on whether tea/smoking</th>
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<tbody>
<tr>
<td>Does it make you thirsty? (dry throat)</td>
<td>16</td>
<td>10</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Does it affect your appetite?</td>
<td>18</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Does it make you urinate?</td>
<td>1</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does it give you bowel action?</td>
<td>1</td>
<td>28</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Does it make you dizzy?</td>
<td>1</td>
<td>28</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Does it give you a headache?</td>
<td>1</td>
<td>23</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Does it make you spit?</td>
<td>5</td>
<td>19</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Does it give you fear of “mad”?</td>
<td>0</td>
<td>29</td>
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<td></td>
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<tr>
<td>Does it make you feel aggressive?</td>
<td>1</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does it affect your sex drive?</td>
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<tr>
<td>Does it affect your sex performance?</td>
<td>10</td>
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<td>Does it make you feel “merry”?</td>
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<td>Does it make you feel sad?</td>
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<td>26</td>
<td>1</td>
<td></td>
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<tr>
<td>Does it make you see things?</td>
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<td>21</td>
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<td>Does it make you “conscious”?</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Does it make you sociable?</td>
<td>23</td>
<td>3</td>
<td>1</td>
<td></td>
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<tr>
<td>Does it make you relaxed?</td>
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<td>9</td>
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<tr>
<td>Does it affect your vision?**</td>
<td>7</td>
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<td>1</td>
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<tr>
<td>Does it affect your taste?</td>
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<tr>
<td>Does it affect your smell?</td>
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<tr>
<td>Does it affect your hearing?</td>
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<tr>
<td>Does it affect your time sense?</td>
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<tr>
<td>Does it affect your speech?</td>
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<td>Does it make you perspire?</td>
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<tr>
<td>Does it make you meditate?</td>
<td>21</td>
<td>5</td>
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<td>2</td>
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† A situational response would be, for example, “only when I am working,” “only when I am around women,” “when it is time to eat.”
* This was often interpreted as “seeing” how to solve a problem.
** Response to this was, in two cases, “it gives me ‘redeye’.”
APPENDIX VIII. Life expectancy table*

Jamaica, complete expectation of life ($e_x$), 1879–82 to 1959–61 and gains in expectation of life

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