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**JOHANNESBURG KAFFIR BEER RESEARCH PROJECT**

**PSYCHOLOGICAL, NUTRITIONAL AND SOCIOLOGICAL STUDIES  
OF KAFFIR BEER**

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D. H. READER  
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**SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH  
PRETORIA  
1964**

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JOHANNESBURG KAFFIR BEER RESEARCH PROJECT

Psychological, Nutritional and Sociological studies of  
Kaffir Beer

Sponsored by the  
JOHANNESBURG CITY COUNCIL

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NEUROPSYCHOLOGY DIVISION  
NATIONAL INSTITUTE FOR PERSONNEL RESEARCH (N.I.P.R.)

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SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH  
PRETORIA  
1964

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## INTRODUCTION

The role of Kaffir Beer in the traditional life of the Bantu-speaking tribes of South Africa has been well documented. In the last three decades, however, large urban African communities have been established and the part played by Kaffir Beer in these communities has not been defined. The City Council of Johannesburg found itself faced with the question whether the continued supply of Kaffir Beer to its African population is beneficial or detrimental to drinkers and those sharing their environment.

Wishing for guidance on this question, the Johannesburg City Council approached the South African Council for Scientific and Industrial Research with the suggestion that a detailed scientific investigation of various aspects of Kaffir Beer be undertaken.

This obviously embraced sociological, physiological, psychological, nutritional and chemical problems and called for a special investigation of Kaffir Beer in relation to other beverages.

These studies were carried out during the years 1959 to 1962 and are presented here in summarized form. The details of the experiments and surveys and their results are available in a series of reports submitted to and obtainable from the Manager, Non-European Affairs Department, 80 Albert St., Johannesburg,

Due to N.I.P.R. staff changes, the conclusions and recommendations based on the sociological studies of Mrs. Sachs were formulated by D.H. Reader.

The authors, on behalf of the C.S.I.R. express their great appreciation of the assistance and co-operation received from Councillor P.R.B. Lewis, Mr. W.J.P. Carr, the Johannesburg Kaffir Beer Project Steering Committee and numerous employees of the Johannesburg City Council.

**The term Kaffir beer used in this report has been superseded by the term Bantu beer in terms of Act 63 of 1962.**

THE PROCEEDINGS OF THE BOARD OF DIRECTORS OF THE COMPANY

HELD AT THE OFFICE OF THE COMPANY ON THE 15th DAY OF MARCH 1955

IN THE PRESENCE OF THE FOLLOWING MEMBERS:

ASSIGNMENTS

CONCLUSIONS

AND

RECOMMENDATIONS

1. THE COMPARATIVE INTOXICATING EFFECT OF KAFFIR BEER.  
BRANDY, EUROPEAN BEER AND WINE

G.K. Nelson

1.1 ASSIGNMENT

The original assignments to the Neuropsychology Division of the National Institute for Personnel Research were contained in a memorandum from the City Health Committee of the Johannesburg Non-European Affairs and City Health Departments dated 27th May 1960 (hereinafter referred to as the Research Proposal). The assignments were as follows :

1.1.1 Investigations of the comparative intoxicating effect of Kaffir Beer, brandy, European beer and wine (Research Proposal, page 1, A (1)a ).

1.1.2 Observations on the relationship between alcohol intake, blood sugar levels, the state of fullness of the stomach; after a meal of bread and mineral water; after a normal meal; on an empty stomach (Research Proposal, page 3, B(3)b. (viii) ).

For the reasons given below, (1.2.3) only 1.1.1 was practicable, and the aim of these investigations was thus :

To compare, by means of psychological and neuropsychological measures, the intoxicating effects of Kaffir Beer, brandy, European beer and wine.

1.2 RESEARCH UNDERTAKEN

1.2.1 Screening of volunteers. Preliminary electroencephalograms (EEG's) were obtained from 58 volunteers to assess the normality or otherwise /...

otherwise of the electrical activity of their brains. In addition, full medical examinations were done.

1.2.2 Survey of drinking habits : The average amount of Kaffir Beer drunk daily by this group was .9 pints.

1.2.3 Pilot Study : EEG's and psychological tests were administered to 39 volunteers after drinking  $\frac{1}{2}$  gallon Kaffir Beer, and, on another occasion, after drinking tea. The subjects refused to drink Kaffir beer without food. For this reason, and because a study of these conditions of fullness of the stomach would have led to a disproportionate increase in the time taken for these investigations, a standard amount of food (one meat pie) was supplied during these and subsequent experiments.

1.2.4 Comparative Study : The effects of various drinks on the EEG and on performance of psychological tests was measured. Kaffir beer, brandy, European beer and wine, in amounts equated for alcohol content (67 ccs. of ethyl alcohol) as well as a non-alcoholic "Kaffir beer" placebo, were given in differing orders to 25 volunteers.

### 1.3 CONCLUSIONS

1.3.1 Kaffir Beer ( $\frac{1}{2}$  gallon) produced a measurable effect on the EEG, which was closely related to blood alcohol concentration. Effect on psychological measures ~~was~~ <sup>was</sup> variable.

1.3.2 Differences among the volunteers in response to alcohol were marked.

1.3.3 Differential effects of the four alcoholic drinks ( $\frac{1}{2}$  gallon Kaffir beer, approximately 5 tots brandy, nearly  $\frac{1}{2}$  gallon European beer and approximately 1 pint wine) were insignificant.

1.3.4 /...



1.3.4. There were significant differences in neuropsychological and psychological measures when the trials with alcohol were combined and compared with those with the placebo.

1.3.5. Kaffir beer was thus shown to be neither more nor less intoxicating than brandy, European beer and wine, given equivalent amounts according to alcohol content.

1.3.6. However, attention is drawn to the fact that the subjects in these experiments refused to drink Kaffir beer without food. It is by no means unknown in world drinking patterns for alcohol to be taken with food, this having the effect of reducing the absorption and hence the effect of alcohol on the individual (Reader, 1964).

1.3.7. Independently of the alcohol effect, the consumption of Kaffir beer has an intentional advantage (Novellie, 1964).

1.3.8. In addition, by virtue of the relatively low alcoholic content of Kaffir beer, a physical limitation is placed on its consumption.

#### 1.4. RECOMMENDATION

On the basis of its neuropsychological and psychological effects, there is no reason for preventing or restricting the supply of Kaffir beer, unless such prevention or restriction were also to apply to brandy, European beer and wine.

#### 1.5. REFERENCES

- NELSON G.K. A Neuropsychological Study of the Comparative Intoxicating Effects of Various Alcoholic Beverages. C.S.I.R. Contract Report G.36/62, 1962.
- NOVELLIE L. The food value of Kaffir beer, in Johannesburg Kaffir Beer Research Project, Johannesburg City Council, 1964.
- READER D.H. Alcoholism and Excessive Drinking: a Sociological Review Unpublished reports, National Institute for Personnel Research (South African National Council on Alcoholism, Johannesburg, 1964).

2./ .....

2. EFFECTS OF KAFFIR BEER ON WORK EFFICIENCY

H. Reuning

2.1 ASSIGNMENT

The task assigned to the Applied Experimental Psychology Division of the N.I.P.R. was :-

To investigate the effect of Kaffir Beer drinking on work competency and industrial hazard.

Research Proposal, 27th May, 1960, p. 1, A.1. (b).

2.1.1 This was recognized as a long-term project with many facets, of which the determination of immediate effects of Kaffir Beer on work output in a controlled work situation appeared to be a realistic sub-project.

However, all efforts to find (i) a suitable work situation in which work performance would be reliably measurable; and (ii) comparable samples of workers consisting of non-drinkers and drinkers, matched for relevant characteristics other than drinking habits, were unsuccessful (3).

2.2 RESEARCH UNDERTAKEN

Instead of the originally planned investigation (1), a relatively limited study had to be carried out, comparing work output, in a task of sand excavation, of three groups, each of 8 workers, namely

- (a) those who stated that they drink KB daily;
- (b) those who stated that they drink KB occasionally;
- (c) those who stated that they do not drink any alcoholic beverage.

This experiment is described in (2) and summarized in (4).

## 2.3 CONCLUSIONS

2.3.1 The experiment did not furnish conclusive evidence that the drinking of Kaffir Beer had a direct measurable effect on work efficiency. Although significant differences in performance between the groups of drinkers, occasional drinkers and non-drinkers were found, the non-drinkers generally performing best, these differences could not be attributed to alcohol consumption as such. It appeared at least equally likely that the differences in output were attributable to personality differences which were brought to the fore by separating the experimental subjects according to drinking habits (2, 4).

2.3.2 The experimental results suggested that interference with the subjects' normal work motivation, by providing or withholding KB, was unavoidable in an experiment of this kind and could have more drastic effects on work efficiency than the alcohol consumption itself (4).

2.3.3 Work output figures of the "occasional drinkers" showed that after-effects (hang-over) of KB drinking and/or deprivation effects could be at least as important as the direct effects (4, p.6).

## 2.4 RECOMMENDATIONS

2.4.1 Since this experiment has merely confirmed the complexity of the problems involved, no change of existing policies, concerning the production and distribution of KB, can be recommended on the strength of its findings.

2.4.2 Because of the interaction of KB drinking with motivational aspects of work performance, laboratory experiments, preferably on continuous work tests, should precede any further field studies on KB

and /...

and work competency.

2.4.3 Investigations of the long-term effects of KB drinking on the worker's health and personality would be desirable.

## 2.5 REFERENCES

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Memorandum submitted to the Manager, Non-European Affairs Department, Johannesburg City Council, November, 1960.
2. REUNING, H. : The effect of Kaffir Beer on work efficiency. Interim report on the first experiment with workers excavating sand. May 1961.
3. REUNING, H. : Memorandum on the feasibility of an investigation into the effects of Kaffir Beer on work efficiency, using work sample tests under near normal work conditions.  
Submitted to the Steering Committee, Johannesburg Kaffir Beer Research Project, December, 1962.
4. REUNING, H. : Studies of Kaffir Beer in relation to Work Efficiency. Summary Report

3. THE FOOD VALUE AND THE INTOXICATING FRACTIONS  
OF KAFFIR BEER

L. Novellie

3.1 ASSIGNMENT

The Kaffir Beer Unit was charged with (1) carrying out certain research tasks enumerated below, and (2) providing certain services to the other investigating bodies. (Research Proposal, p.1, A.2).

3.2 RESEARCH UNDERTAKEN

The original programme detailed in the Research Proposal was lengthy and wide in its aims. Preliminary work indicated that the following modified aims would represent a realistic programme capable of being fulfilled within a reasonable time.

3.2.1 Further laboratory investigations into the food value of Kaffir Beer : (Investigations by the C.S.I.R. prior to this project had proved the vitamin content of Kaffir Beer to be very good).

3.2.2 A determination of the intoxicating fractions in Kaffir Beer.

3.3 SERVICES

3.3.1 A comparative investigation of laboratory methods for determining alcohol.

3.3.2 Checking the laboratory routines of the City Health Department Laboratory (mainly blood alcohol determinations).

3.3.3 /...

3.3.3 Preparation of a placebo (a drink resembling Kaffir Beer in all respects except for alcohol content). The placebo was to be used as a control in an investigation of the relative intoxicating effects of Kaffir Beer and various European liquors by the National Institute for Personnel Research of the C.S.I.R.

3.4 RESULTS AND CONCLUSIONS

3.4.1 Research task - Food value of Kaffir Beer : Half-a-gallon of Kaffir Beer a day supplies approximately 39% of the total daily protein requirements of an adult, <sup>1</sup> whereas distilled liquor supply none.

Previous investigation <sup>2</sup> has shown that Kaffir Beer is a good source of the B-vitamins; therefore, by supplying protein and B-vitamins, Kaffir Beer admirably fulfils the roles of a supplementary food-stuff.

3.4.2 Research task - The intoxicating substances of Kaffir Beer : The primary intoxicant of all fermented drinks is, of course, alcohol. Secondary products of fermentation, the fusel oils, are commonly held responsible for the 'hangover' after unwise drinking. <sup>3</sup> A comparison of the intoxicating effects of Kaffir Beer with those of other alcoholic liquors is given in the report of the National Institute for Personnel Research. Research by the Kaffir Beer Unit has shown that Johannesburg Kaffir Beer has a lower fusel-oil content than the average <sup>Kaffir</sup> beer. <sup>4</sup>

3.4.3 Service - alcohol determination : The method used for alcohol determination by the City Health Department Laboratory and the Kaffir Beer Unit was found to be very satisfactory. <sup>4</sup>

3.4.4 Service - blood alcohol determinations : Routine blood alcohol determinations by the Johannesburg City Health Department Laboratory were checked and found satisfactory. <sup>4</sup>

3.4.5 /...

3.4.5 Service 1.2.3 - preparation of placebo : Attempts to prepare a placebo to aid the N.I.P.R. were successful. <sup>4</sup>

3.5 REFERENCES

1. DREYER, J.J. and L. NOVELLIE : An Investigation of the Nutritional Value of the Proteins in Kaffir Beer and its Basic Ingredients.  
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p. 395, 3rd Ed., Cambridge  
University Press.
4. L. NOVELLIE : Report on the work done on the Johannesburg Kaffir Beer Research Project by the National Chemical Research Laboratory of the S.A.C.S.I.R. May 1963.

4.

SOCIOLOGICAL STUDIES OF KAFFIR BEER

D.H. Reader

4.1 ASSIGNMENT

The Industrial Sociology division of the N.I.P.R. was charged with investigating :

- (a) the role played by Municipal Beerhalls and gardens in the social and family life of the Native in the City and townships;
- (b) the advisability of distribution of Kaffir Beer to employers and factory canteens for supply to Non-European employees;
- (c) the part played by Kaffir Beer in the diet of the Native;
- (d) the possible effects of the distribution of Kaffir Beer from off-sales depots;
- (e) the desirability of supplying other forms of beverages as well as food through the Council's beerhalls." (Research Proposal, p. 2, A.3. (a) - (e) ).

The primary aim of the study as seen by the division was task (a) in relation to the general drinking patterns and hence the leisure-time activities of the community as a whole.

4.2 RESEARCH UNDERTAKEN

In attempting to define the role of the beerhalls in the social and family life of Johannesburg's black population, it was necessary to establish the traditional versus western orientation of the community. Thereafter the drinking and leisure patterns would be

outlined /...



outlined, and the extent to which the beerhalls featured in these patterns. Finally, an attempt would be made to assess whether the beerhalls were beneficial or detrimental to the community.

To obtain factual and attitudinal material on current drinking and leisure behaviour, on aspirations associated with these patterns and on the use made of beerhalls, 683 men and 322 women resident in the municipal townships were interviewed. A stratified sample in terms of income and occupation was aimed at, but the selection procedure achieved greater representation of the upper levels of the population than would have resulted from random sampling. Subsidiary material was obtained from interviews with superintendents of townships and beerhalls and through observations in beerhalls and shebeens.

4.3 CONCLUSIONS AND RECOMMENDATIONS

4.3.1 The social role played by the Municipal beerhalls and gardens is positive and functional in that :

- (1) the majority of the male sample were found to drink, many of them daily; and Kaffir Beer is the beverage most consumed by them.
- (2) although beerhall frequenters drink more often than other drinkers, they spend less a week on drink; they make less use of shebeens than other drinkers and have the lowest percentage of bottle-store customers among them.
- (3) beerhalls cater especially for the large majority of labourers and semi-skilled commercial and industrial workers, who are either treating the halls as substitutes for traditional drinking-group settings or developing through them new urban working-class drinking /...

drinking patterns.

- (4) the lower socio-economic classes have few leisure-time activities, and many appear to depend considerably on the beerhalls for relaxation.
- (5) Although most of the female sample were opposed to beerhalls, mainly as threatening to the wife's roles of mother and house-keeper, their objections were to drinking in general and would persist even if the beerhalls were closed.
- (6) the halls cater for the present needs of an impoverished working class which, judging by the middle class above it, will develop into wider fields of interest as technological and social progress ~~including economic~~ in the township is made.

4.3.2 It is not advisable that Kaffir Beer be distributed to employers and factory canteens for supply to non-Europeans. The overwhelming majority of both male and female samples oppose this suggestion with respect both to lunch-time and to after-work sales. Opposition to lunch-time supplies relates to anticipated ill-effects on work and to money wasted. After-work distribution is rejected because of concern for family welfare and for the safety of men travelling home after drinking.

4.3.3 An attempt was made to collect data on the general eating and drinking habits of the sample, but the evidence is sparse and unreliable. No sociological recommendations are made on the part played by Kaffir Beer in diet.

4.3.4 /...

4.3.4 More than a third of male and of female drinkers in the samples made use of off-sales facilities. Since the gross majority of these drinkers said that the off-sales departments and depots met their requirements, the continuing possibility exists for the successful distribution of Kaffir Beer from off-sales sources.

4.3.5 Just over half the beerhall frequenters favour the supply of alcoholic beverages other than Kaffir Beer at the halls, while one-third would prefer the beerhalls to be kept exclusively for the distribution of Kaffir Beer. The Beerhall and Township Superintendents agree with the latter view and recommend that European liquor be dispensed from separate premises. The majority of beerhall frequenters in the sample are not interested in restaurant facilities, as they prefer to eat at home.

4.4 REFERENCES

1. SACHS, HESSIE The Role of the Beerhalls in the Municipal Townships of Johannesburg : A Social Psychological Study. First Report, National Institute for Personnel Research, March 1962.
2. SACHS, HESSIE The Role of the Beerhalls in the Municipal Townships of Johannesburg : A Social Psychological Study. Second and Final Report, National Institute for Personnel Research, October 1962.
3. SACHS, HESSIE 'The Role of the Beerhalls in the Social and Family Life of the Native Population of Johannesburg'. In : Sociological, Psychological and Nutritional Studies of Kaffir Beer. South African Council for Scientific and Industrial Research, Pretoria, 1964.

SUMMARIES OF RESEARCH REPORTS

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THE EFFECTS OF KAFFIR BEER, AS COMPARED WITH  
OTHER ALCOHOLS ON BRAIN FUNCTION AND BEHAVIOUR

G. K. NELSON

The sale by local authorities of Kaffir Beer raised the question of the effects of the consumption of such liquor on personal efficiency. The recent legislative changes in the Republic, making for the relatively free supply of all alcoholic beverages to the non-white population, have led to the problem of whether the consumption of Kaffir Beer is followed by immediate consequences which differ in any way from those connected with drinking "European-type" wines, malts and spirits.

In the absence of previous systematic investigations of the psychological and physiological effects of Kaffir Beer in relation to other alcoholic beverages, the National Institute for Personnel Research undertook an extensive series of experiments designed to compare the intoxicating effects of these drinks.

The precise assessment of degree of intoxication is a complex task. Individual differences in susceptibility to the effects of alcohol, variations in motivation to perform on tests, and fluctuations in attention and level of consciousness make the interpretation of psychological test scores hazardous. Hence the study of the effects of alcohol on behaviour must be so designed as to minimize the influence of such individual factors, and is greatly assisted by the inclusion of physiological data.

It was decided to determine the effects of alcohol consumption on a number of psychomotor tests providing measures of reaction time, speed of finger movement, steadiness, manual

/dexterity . . . .

dexterity,, coordination, visual perception rate and discrimination and reasoning ability. These data would be supplemented by determinations of changes in blood alcohol concentration, the electrical activity of the brain (electroencephalogram or EEG), electrocardiogram (EKG), respiration, blood pressure and electrical resistance of the skin.

Volunteers were called for from the Police Force of the Johannesburg Non-European Affairs Department and 59 Bantu policemen came forward. The group was first given a full medical examination for the purpose of excluding any person with severe abnormalities which might render him unsuitable for experiments involving alcohol. Of the 59, 21 were found to have a history of head injury, 5 of hypertension, 6 of venereal disease, and 2 of hepatic disease. None of these was considered serious enough to warrant exclusion from the study. One volunteer, however, gave a history of epilepsy, but was nevertheless included because it was felt that the EEG would provide sufficient warning of seizures that might occur during the experiments.

At the same time as the medical examination the volunteers were given a questionnaire on their drinking habits, the results showing a wide variation in preference for type of drink, and place and time of drinking.

All 59 volunteers were then subjected to an EEG examination in the Carnegie Mobile Laboratory of the N. I. P. R., at the Vocational Training Centre, Dube. This had the two-fold

/purpose . . . .

purpose of a further screening and of acquainting the subjects with the complicated EEG testing situation in the hope of allaying any anxiety they might have had prior to the experiments proper.

The first experiments were aimed at establishing the most suitable amount of Kaffir Beer for administration in the laboratory situation, and also whether this would provide a measurable change in psychological and physiological data. The questionnaire responses had revealed that the average claimed Kaffir Beer consumption in this group was approximately .9 gallon. Because the experiments would occupy about 6 hours, each subject was given one hour to drink half a gallon of Kaffir Beer, after preliminary tests occupying about  $\frac{3}{4}$  hour. The subjects drank in a group, with music provided by a tape-recorder and were allowed to smoke, play cards and read. The purpose here was to provide as "natural" a situation as possible.

At the end of the hour allotted for drinking, the tests were again administered, and repeated twice more at intervals of one hour.

On another day the subjects were given tea instead of Kaffir Beer, with the same testing programme.

Data were obtained for the two situations from 29 men, tested in groups varying from 7 to 10.

Compared with tea, which produced no change in the test results, Kaffir Beer led to variable changes on the psychological tests, but in general, slowed the alpha rhythm of the EEG,

/as had ....



as had been expected. This slowing closely paralleled the increase in blood alcohol concentration.

None of the subjects became more than slightly intoxicated during these preliminary studies. While it was recognized that such factors as variations in degree of motivation and wakefulness affect psychological test scores in such studies, further tests were carried out to investigate the possibility of producing more consistent changes by the use of a greater quantity of Kaffir Beer. Using a similar testing schedule to the first experiment, but again in the Mobile Laboratory, a group of eight subjects from a different population, namely C. S. I. R. cleaners, was given  $\frac{3}{4}$  gallon of Kaffir Beer.

These tests confirmed the first results and did indeed reveal a greater deterioration in psychomotor test performance. However, one subject became nauseous and one fell asleep, both being unable to continue the experiment. This led to the conclusion that  $\frac{1}{2}$  gallon of Kaffir Beer was the preferable amount to use in order to avoid the loss of data as a result of subjects becoming incapacitated.

The plan for the main experiment involving the comparison of the effects of Kaffir Beer, beer, brandy and wine called for five successive days of testing of 25 subjects in groups of five. The subjects were again drawn from the original volunteers and each received the 4 drinks and a placebo in a different order over the five days. This experimental design was intended to minimize the effects of individual differences and to emphasize the role of the different drinks. The placebo was a Kaffir Beer from

/which the . . . .

which the alcohol had been removed by vacuum-distillation and to which was added a small quantity of brewer's yeast and glucose immediately before administration. This produced a drink indistinguishable from the genuine article but with an alcohol content averaging only 0.63% weight/volume.

Each drink contained 67.2 ccs of ethyl alcohol, the quantities used being shown in Table I.

TABLE I

ALCOHOL CONTENT AND QUANTITIES USED OF THE 5 BEVERAGES

BEVERAGE	ALCOHOL CONTENT (% w/v)	QUANTITY USED	
		approx c. c.	Imperial
Kaffir Beer	3.00 (nominal)	2200	$\frac{1}{2}$ gallon
"European" beer	3.59	1872	Nearly $\frac{1}{2}$ gallon
Brandy	34.7	194	Nearly 5 tots *
Wine	13.8	487	Nearly 1 pint
Placebo	less than 1.00	2200	$\frac{1}{2}$ gallon

\* The brandy was diluted with 300 cc. of "Canada Dry" Ginger Ale, making the volume up to approximately 1 pint so as to approximate that of the wine. In general the subjects regarded this mixture as "too weak".

Estimations of blood-alcohol concentration were omitted from these final experiments for two reasons : firstly, 20 samples of blood would have had to be obtained from each subject over five days, and the attendant discomfort could have jeopardized

/the cooperative ....

the cooperative attitude of the volunteers; secondly, the close relationship between blood-alcohol level and alpha frequency, found in the two preliminary experiments, justified the omission of blood-sampling at this stage.

Compared with the placebo, the four alcoholic drinks tended to slow the brain rhythm, increase heart rate and respiration, decrease speed of finger movement, interfere with learning on the visual and reasoning tests, and increase errors in coordination. However, there were marked individual differences in the reaction of the subjects to alcohol, and no alcoholic drink showed an effect differing significantly from any other except the placebo.

It was concluded that the effects of individual differences are far greater than those attributable to any one alcoholic drink.

A detailed account of these investigations is given in the report cited below :

REFERENCE :

NELSON, G. K. : A Neuropsychological Study of the Comparative Intoxicating Effects of Various Alcoholic Beverages.  
C. S. I. R. Contract Report G30/62, 1962.

THE FOOD VALUE AND THE INTOXICATING FRACTIONS  
OF KAFFIR BEER

by

L. Novellie

THE FOOD VALUE OF KAFFIR BEER

From the nutritional point of view, the value of a food or beverage lies in its content of protein, fat, carbohydrate, vitamins and minerals. Some foods contain suitable proportions of almost all of these, e.g. milk; others contain only one or two, e.g. sugar - almost pure carbohydrate; butter which is principally fat with some vitamins and little water. Few foods are suitable as a sole source of nourishment and the best diet is a mixed one in which the foods are chosen to supplement one another nutritionally. Even milk has its deficiencies (iron and vitamin C) and requires some supplementation. One of the chief drawbacks to the use of liquid foods is their dilute nature. Milk and soups, etc., are largely water and have to be consumed in great quantities if they are to provide the bulk of the nutritional requirements. For this reason, solid foods are generally to be preferred. There is no reason, however, why liquids should not be used to supplement a diet of solid foodstuffs.

Keeping these basic facts in mind, it is clear that kaffir beer, which contains roughly 90% water, must be regarded not as a food in itself but as a supplement to the Bantu diet. What then does kaffir beer offer from this point of view? Furthermore, what are the chief deficiencies in the diet of the Bantu? A number of relatively detailed analyses of kaffir beer (and of its ingredients) have been carried out by the C.S.I.R. (1). These have shown that kaffir beer, besides containing 3% alcohol, has a total solids content of about 6%, made up largely of carbohydrate but containing some protein (about 0.6% of the beer), and is furthermore rich in the B-vitamins.

The / ...

The diet of the Bantu is rich in carbohydrate, usually too rich for a proper balance of nutrients, and is lacking in protein and vitamins. The protein and vitamins of kaffir beer are, therefore, its most important nutritional components. The starch and other carbohydrates, whilst not filling a particular nutritional need, serve to slow down the absorption of alcohol and are thus not without value.

Table II, taken from the C.S.I.R. publication mentioned (1), compares the quantities of the B-vitamins to be found in kaffir beer with the minimum daily requirements.

TABLE II

AMOUNTS OF B-VITAMINS SUPPLIED BY HALF-GALLON OF KAFFIR BEER

	Found in the beers examined		
	Thiamine (Vitamin B <sub>1</sub> )	Riboflavin (Vitamin B <sub>2</sub> )	Nicotinic Acid
Minimum	0.45	0.61	2.9
Maximum	5.2	3.9	15.0
Average	2.1	1.3	7.2
Minimum daily requirements (United States Food and Drugs Administration)	1.0	1.2	10.0

By comparing the minimum daily requirement for these vitamins with the average values found in kaffir beer, it can be seen that half-a-gallon of the beer supplies between 70 and 200% of the amounts needed.

Until recently no precise assessment had been made of the actual nutritional value of the protein in kaffir beer (2)(3). The protein nutrition of the Bantu (the major consumers of kaffir beer) has in recent years become a matter of considerable concern to nutritionists and health authorities in

most / ...

most of the under-developed countries of Africa. The consumption of good quality animal protein by the Bantu of all ages is generally low (3) compared with certain "safe practical allowances", e.g. those of the FAO (1957) (3). What is the importance of protein in the diet? All body tissues (skin, muscles, etc.) and organs (heart, liver, lungs, etc.) contain proteins as essential ingredients. These proteins differ in their essential physical characteristics, e.g. compare the softness and flexibility of hair and skin with the toughness and hardness of finger nails. These outward characteristics are a reflection of differences in the structure and amino-acid composition of the proteins.

Amino acid may be likened to bricks of different sorts which can be used to build a wide variety of structures from houses to museums and factories. The proteins of the diet have to be digested (broken down to individual amino acids) and then re-assembled into the particular proteins needed by the body. Not all proteins are easily digested, and their particular assortment of amino acids and the quantities in which they occur may not be quite those required by the body. Therefore, in assessing the value of proteins offered by a particular food, it is necessary to establish how digestible they are and whether their amino-acid composition is particularly suited to the needs of the human body, i.e. their biological value. To do this scientifically, it is usual to employ test animals, as it is difficult to test human beings under the special conditions required. With the aid of the growing rat, the response of which is very similar to the human subject, both the digestibilities of the proteins and their biological values can be readily assessed. The use of the rat as opposed to man has the practical advantages of saving time, labour and expense, and particularly of maintaining careful experimental control.

In assessing the value of the protein in kaffir beer, it was necessary to evaporate the beer until all the liquids had gone. The dry powder remaining was fed to the rats in a diet supplemented by the addition of fats, carbohydrates, etc. This diet was designed to be complete and sufficient with regard to all the food factors and nutrients. The only component of questionable value was the protein contributed by the solids

from / ...

from the kaffir beer. The way in which the rats progressed on this diet would, therefore, be a reflection of the quality of the kaffir beer protein. Measurements were made of body weight, and of the total intake of protein, and of material lost in faeces and urine, the latter representing material which the animal could not build up into flesh, etc. Rats were also fed on the ingredients used to make kaffir beer, viz., maize, kaffircorn and kaffircorn malt. For comparison, a group of rats was fed on egg protein, which is known to be an easily digested protein of high biological value.

The proteins in kaffir beer were found to have a digestibility of 82.8% and a biological value of 72.7% (egg protein gave 96.5 and 97.4%, resp.) (3).

If the daily consumption of kaffir beer were half-a-gallon containing 8% solids, then the assimilable protein intake would, according to the present results, be 13.3 g, which is 39% of the recommended daily allowance. To get the full requirements, about  $1\frac{1}{3}$  gallons would have to be drunk. Clearly then, moderate quantities of kaffir beer can supplement the daily supply of protein to a valuable degree, but immoderate amounts would be needed to give the full requirements for protein.

It appears, furthermore, that a considerable amount of assimilable protein is lost during brewing in the form of beer waste or strainings, since the sample of strainings investigated contained no less than 13.6 g of assimilable protein per 100 g dry weight, i.e., about as much as is present in half-a-gallon of beer. It would appear, therefore, that benefit could be obtained by increasing assimilable protein in the beer by reducing the quantity of material strained off during brewing.

The relatively poor assimilability of the kaffir beer proteins is typical of most cereal proteins and is due to their deficiency in one or more of the essential amino acids - lysine, tryptophan and methionine. [It is because of the lower quality of cereal proteins that most nutritionists recommend the use of the so-called animal protein to be found in meat, fish, eggs, milk and cheese.] It has been repeatedly shown that the assimilability of such proteins can be raised considerably, either by the addition of the limiting amino acids or by supplementation with other proteins, e.g. fish

flour / ...

flour protein, which contains an abundance of some of these limiting amino acids (3). These considerations make it desirable to investigate the possibilities of raising the protein value of kaffir beer by fortification.

To summarise, it has been shown that the protein of kaffir beer possesses the deficiencies common to most cereal proteins. Nevertheless, sufficient protein is present in half-a-gallon of kaffir beer to provide up to 39% of the total daily requirements of the adult. Much depends on the beer having a sufficiently high content of solids.

Previous work has shown that kaffir beer is a good source of the B-vitamins, so that, by supplying B-vitamins and proteins, kaffir beer admirably fills the rôle of a supplementary foodstuff.

#### INTOXICATING SUBSTANCES IN KAFFIR BEER

The chief intoxicating substance in kaffir beer is, of course, alcohol, or to give it its full chemical name, ethyl alcohol. The effect of alcohol on the drinker has been the subject of numerous investigations all over the world, and the special rôle played by kaffir beer in the life of the urbanized Bantu has been the particular aim of the Johannesburg Kaffir Beer Research Project. Whilst the effects of ethyl alcohol are of great importance, there are other effects caused by drinking fermented liquors. When yeast ferments sugar, the chief products are ethyl alcohol and carbon dioxide, but there are formed, at the same time, very small amounts of a wide variety of other substances which are of great importance, in spite of their being present in only very low concentrations. They consist mainly of the higher alcohols, of esters, aldehydes and ketones, all of which have pronounced smells. It is these materials that are responsible for the bouquet and aroma of wines, brandies and whiskies, and various other fermented drinks. Unfortunately, besides adding much to the enjoyment of the drinker, some of these substances have unpleasant physiological effects. Crudely distilled spirits, for example, have a high content of the higher alcohols (called fusel oils by the trade) which are responsible for the 'hangover' after unwise drinking. Distillation, unless skillfully carried out, tends to concentrate the fusel oils in the final product. The fusel

oils / ...



oils are, however, always present, even in the undistilled beverage. The kind of yeast used and the conditions under which the fermentation is carried out all have an effect on the fusel oil content. Obviously, a good kaffir beer should have as low a fusel oil content as possible.

The fusel-oil content of kaffir beer, never before having been determined, was a completely unknown factor. It was necessary therefore to select methods used for the measuring of fusel oils in European liquors and to apply them to kaffir beer. The final determinations were based on methods developed by C.S. Boruff and by the Association of Official Agricultural Chemists. Certain modifications were found necessary in order to make the method suitable for kaffir beer.

After the method had been carefully tested it was applied to 13 samples of kaffir beer obtained from a number of breweries including the samples from the Johannesburg brewery. The results (Table III) showed that the Johannesburg kaffir beer had a relatively low fusel-oil content compared to the beers from other municipalities.

A more detailed picture of the fusel-oil content was obtained by means of gas chromatography.

TABLE III / ...

TABLE III

THE FUSEL-OIL CONTENT OF KAFFIR BEER FROM  
A NUMBER OF RAND AND OTHER BREWERIES

Municipality	Fusel-oil content mg fusel oil/l. of beer
A	253.0
B	200.0
C	241.0
D	231.5
Johannesburg 1	179.0
Johannesburg 2	182.5
E	233.0
F	197.7
G	263.5
H	303.3
I	285.3
J	255.3
K	126.0
Average of all beers	227.0

ADDENDUM / ...

A D D E N D U M

THE INTOXICATING EFFECT OF ILLICIT CONCOCTIONS

It was thought that the intoxicating effect of illicit liquors might be stronger than that of kaffir beer because of a possibly higher fusel-oil content. A number of samples of illicit liquors were obtained by the Johannesburg Municipality, treated to prevent further fermentation after they had been seized, and passed to the Unit for analysis. These were analysed for alcohol and fusel oils.

The alcohol content of the concoctions (excluding the distilled sample) averaged 3.33% w/v (cf. legal limit for kaffir beer of 3% w/v alcohol). Twenty-one out of 32 samples exceeded the legal limit, fifteen to a noteworthy degree. The distilled concoction had 21.28% w/v alcohol (cf. wine 13.8% w/v, brandy 34.7% w/v, "European" beer 3.59% w/v used in Table I).

The fusel-oil content of the majority of brews was not high. The single sample of distilled liquor had a very high fusel-oil content, almost 20-times the average value for the other concoctions. Accepting these samples as being representative, it would seem, therefore, that most of the brews owe their intoxicating effect not to a high fusel-oil content but simply to a high alcohol content. It is not impossible of course that there may be other factors of an unknown nature in these brews. In the case of the distilled liquor, it is clear that its potency is due both to a very high alcohol content and to an abnormally high fusel-oil content, approximately 10-times that found in two South African brandies of reputable name. It would seem that illicitly distilled liquor represents a greater menace than the other concoctions and it is to be hoped that the free availability of kaffir beer and other properly manufactured liquor will do much to abate this menace.

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10th March. 1964

LN/DF

EFFECTS OF KAFFIR BEER ON WORK EFFICIENCY

H. REUNING.

It is well known, from many recent investigations in the field of industrial psychology, that work efficiency, i.e. the actual productivity of the worker on the job, is affected by a great multitude of factors. Besides the man's physical work capacity and skill (and intellectual abilities, in the case of mental work) there are individual differences in drive level, i.e. the readiness to make an effort; in adaptability to new or changing tasks; in endurance or staying power; in relative speed and accuracy of work; in steadiness or variability. Superimposed on and interacting with these individual factors are numerous aspects of the work environment, such as incentives, namely monetary and other rewards; the physical and climatic conditions of the work place; the prevailing social climate, including treatment by superiors; and the provisions made for communication between management and worker, understanding the purpose of work, etc.

Although these various factors can be distinguished, they cannot be separated and in the actual work situation all are effective to some degree simultaneously. Productivity must be regarded as the resultant of all these factors and it is clear that an infinite number of combinations of factors may all have a similar final outcome.

Even the immediate effect, let alone a long-term effect, of beer drinking on one of these factors, say work capacity, is likely to be a complex one. The nutritional value of Kaffir Beer may increase work capacity, while the disintegrating effect of its alcohol content on co-ordination, for instance, may lower it, so that in the end no noticeable change in output occurs. Work motivation may be positively influenced by freedom from worries and insufficiency feelings, but negatively by increased

fatigue /...

fatigue, irritability, etc., induced by the consumption of beer. Work capacity as a whole may be impaired, and yet this may be compensated by improved motivation.

These difficulties were realized during the planning stages of this research project. At meetings of the Steering Committee, it was conceded that it may be impossible to determine the effect of Kaffir Beer drinking on work efficiency conclusively. Nevertheless, it seemed desirable at least to attempt an experimental investigation which might throw light on the question of whether Kaffir Beer drinking has or has not a measurable effect on overall productivity.

Two types of experimental design can be employed to answer this question :

- (a) One could compare the work performance of a group of workers who are regular drinkers with that of a group of non-drinkers.
- (b) One could compare the work performances of the same workers in two distinct work periods, one during which Kaffir Beer would be consumed and one during which it would be avoided.

In the case of an (a) type experiment, it would be necessary to select two "matched groups" of workers, i.e. two groups who differ only in drinking habits and not in any other aspect which might be related to work performance. Normally, such groups are not to be found. As a substitute solution, the study of drinking and non-drinking workers in a "closed community" was envisaged. It was thought that dealing with such a group, i.e. workers housed, fed and supervised in a compound would make it possible to eliminate or at least control gross individual differences in eating habits, leisure time activities and the amount of sleep which could not only influence work output directly, but could also have a moderating or aggravating influence on the alcohol effect upon work efficiency. After enquiries, however, it

became /...

became clear that no such "closed community" would be available for the investigation.

An experiment of the type (b), while involving less serious problems of selection and control, would make it necessary to interfere with the normal drinking habits of the workers. These would have to be compelled to drink a certain amount for a certain time and to go without alcoholic drinks for another part of the total work period included in the experiment. An enforced drinking pattern of this kind could almost certainly be expected to affect not only work efficiency, but also, or even more so, work motivation.

After a number of experimental designs (1) had been discarded because they were impracticable, a simplified experiment was planned and carried out. This experiment, a combination of the two experimental designs mentioned above, utilized as a criterion of work output the excavation of 5ft wide and approximately 2½ft deep trenches in sandy soil, their length being the performance variable. The samples had to be reduced to twice three groups of 4 subjects each, i.e. "drinkers", "occasional drinkers" and "non-drinkers", the first three groups working one week, the other three the following week. These groups of men were formed from the normal intake of unskilled labourers of the Housing Division and were matched as closely as possible in respect of age and length of exposure to previous physical work. They were housed and fed at Jabulane Hostel, supervised by an elderly policeman of the Johannesburg City Council Non-European Police Force.

The experiment, carried out at a building site at Emdene in March 1961, aimed at remaining as close as possible to a normal working situation (2). The experiences and results gained from this experiment were, briefly, the following : -

- (i) In spite of the apparent simplicity of the task, the measurements of the amount of work produced per half day, initially taken by the foreman  
of the /...

of the workers, were not reliable. Irregularities in the cross-sections of the individual trenches had the effect that the length of the excavated trench did not truly reflect the amount of work done. A refined measuring procedure was developed on the spot and then applied by the NIPR tester, in order to remove the measuring errors at least from the weekly output figures of the first three groups and to obtain daily output figures for the second three groups. Because of differences in the individual's working hours (late start, interruptions, etc.), the daily scores were converted into an output/time score, in this case cubic meters/hour, of excavated sand.

- (ii) Variance analyses of the output measures obtained in this way showed statistically significant differences :-  
the mean output of the non-drinking workers being significantly higher than that of the other two groups, that of the regular drinkers being the lowest.
- (iii) In the second three groups of workers there is also a significant trend over days, a tendency to produce less towards the end of the week compared with its beginning. A similar downward trend is present, but less marked in the group of non-drinkers.
- (iv) In the group of "occasional drinkers" there is, besides the decrease in output over the five days of the week, a tendency to work less on the 2 non-KB days which follow a day on which KB had been consumed. This group excavated on the first day  $10.3\text{m}^3$  of sand; on the 2 KB days  $8.95\text{m}^3$  / day; and on the 2 days following a KB day  $4.4\text{m}^3$  /day.
- (v) The relative inferiority of performances in the groups of occasional and regular drinkers is considerably more marked in the second week than in the first week of the experiment. Expressing all performances as a percentage of the performance of the first non-drinkers group (setting this equal to 100%) we get :-

Non-  
drinkers /...



	<u>Non-drinkers</u>	<u>Occasional drinkers</u>	<u>Regular drinkers</u>
1st week	100%	81.1%	77.5%
2nd week	105.0%	60.6%	50.1%

The fall-off from the non-drinking to the regularly drinking group is more than twice as large in the second part of the experiment than in the first (see below, p.6, para. 3).

(vi) The general level of performance of the subjects participating in this experiment was low, i.e. they worked less than would have been expected of them under ordinary, non-experimental conditions.

(vii) A number of complaints were raised by the testees and indicated that motivation was not as usual:-

- (a) they disliked staying at the hostel instead of at home;
- (b) they said that food was not sufficient;
- (c) they stated that they would have preferred taking their first meal at 10 a.m. instead of early in the morning.

Although it can be said with certainty that the non-drinkers worked better than the other groups of occasional and regular drinkers, it is not known whether this difference is an effect of alcohol consumption. It was noted, when the groups were formed, on a Thursday preceding the experimental week, that the non-drinkers looked fresher, healthier, more alert and determined than those who said that they liked to drink regularly or occasionally. It is not unlikely that, dividing the total group of labourers into three subgroups according to drinking habits, was equivalent to forming groups of men with different personalities; and that drinking habits were merely symptomatic of differences existing in these men prior to the alcohol consumption prescribed by the experiment. Whether this is entirely independent of or caused by previous long-term alcohol consumption is unknown.

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This seems possible, if not likely, but it could only be determined by observations extending over several years.

Apparently there is a strong after-effect of the KB one day after this had been drunk. This after-effect must be distinguished from the direct alcohol effect on work efficiency, if experimental results are to be of any consequence for practical decisions. In order to separate the direct from the after-effects of KB consumption, longer experimental periods must obviously be used. The very low performance on the non-KB days of the group of "occasional drinkers" might also indicate a deprivation effect. It is not certain that the workers who said that they drank occasionally did not, in fact, drink fairly regularly. A deprivation effect would last much longer than the relatively short after-effect of one day's KB consumption. The present experiment with daily alternation of KB and non-KB conditions for the group of occasional drinkers does not make it possible to distinguish between after-effect and deprivation effect.

The relatively stronger fall-off in performance of the two drinking groups in the second week compared with that in the first week of the experiment (see under (v) above) suggests the presence of a factor of work morale which, in addition to or even more than work capacity, may be susceptible to alcohol effects. It is feasible, if not likely, that news about the experiment had spread and come to the ears of the second group of subjects, telling them more or less what was going on. They may have used more fully the opportunity of taking things easy, provided by the relatively lenient conditions of supervision during the experiment. The disinhibitory effect of alcohol could have caused the drinkers more than the non-drinkers to misuse these liberties given by the situation. In other words, the inferiority of the performances of the drinking groups may be attributable to alcohol effects on capacity or on motivation. We have no means /...

means to decide which is the case. If it is capacity that is affected by alcohol consumption, there is no remedy except abstinence. If on the other hand, the effect is on motivation, there may well be compensating factors, e.g. the satisfaction of social needs, which cancel the negative effects of alcohol. Measures of work motivation are practically non-existent; and the problem is notoriously difficult when it comes to the assessment of work motivation in Non-Whites.

A further aspect should not be overlooked, namely that of differences in physique and body-build. Alcohol consumption is in many ways related to physiological functions such as metabolism, movement control, perspiration and temperature regulation. All of these processes are involved in physical work and some of them are of great importance in the case of work under high temperatures and humidity conditions. Our sand excavation experiment took place in the open in summer, i.e. at relatively high temperatures and under conditions conducive to drinking. In this situation, differences in physique may have a marked effect on the energy requirements of physical work, a factor which in our experiments could not be controlled (if our subjects had had to be matched for body-build as well as for age and experience, we would have been left with no subjects at all). Energy requirements for the control of body temperature, under conditions of muscular work in hot and/or humid climates, tend to be greater in short fat persons (pyknic type) than in tall slender ones (asthenic type), the pyknic type having greater difficulties in dissipating accumulating body heat. The pyknic type will also tend to have the relatively higher blood alcohol concentration with equal amounts of alcohol consumption, body weight being equal. Alcohol may thus aggravate his already existing handicap when doing hard work at high temperatures. The differences in our sand digging experiment may be at least partly due to differences in physique, although no

gross /...

gross differences in this respect had been observed between the groups.

In the light of the above discussion of complicating factors relevant to the problem of alcohol effects upon work efficiency; and in the light of the experienced difficulties in finding suitable groups of workers and suitable types of work for an experimental investigation of this kind, it seems doubtful whether an experiment under near normal working conditions and with a work sample criterion of efficiency can be successful. Such an experiment may very well produce interesting results and perhaps valuable information, but these will probably not give a conclusive answer to the question : What is the effect of Kaffir Beer consumption on work efficiency?

The results of the neuropsychological experiments by Nelson (pp. of this report) utilizing a number of sensitive laboratory tests have shown that very little, if any, differences in test performances occur under various conditions of intoxication, compared with normal conditions. This applies to the type of test used in Nelson's experiments, namely perceptual and skill tests of short duration (5 to 15 minutes).

Before the problem of alcohol effects on work efficiency can be taken any further, it seems necessary to carry out another type of laboratory tests. Tests which would be (a) sensitive enough to show the effects of relative small doses of alcohol; (b) of sufficiently long duration (several hours) to give an indication of after-effects; (c) carried out under conditions which would permit a fair control of motivation changes induced by the fact that the tests are part of an experiment. Such tests are available and have shown some promise in earlier experiments, carried out by the Kraepelin school in the 1920's, mostly, however, on single subjects or very small samples. An experimental investigation utilizing these "continuous work tests" can be expected to provide that information which would be required to undertake a more conclusive study of the alcohol effects on work efficiency and competency.

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THE ROLE OF THE BEERHALLS IN THE SOCIAL AND FAMILY LIFE  
OF THE NATIVE POPULATION OF JOHANNESBURG

HESSIE SACHS

Johannesburg's black population, in common with much of contemporary African society, is undergoing rapid and radical social change. (Hunter (1)) Contact with Europeans and subsequent economic, political and social developments have given rise to transitional societies in which elements of traditional and western culture co-exist. The ultimate direction of their change has not yet crystallised but, within the South African context, two major opposing forces are discernible. On the one hand there is a striving to retain the traditional culture and to adapt the western elements to function within its framework. (Mayer (2)) On the other, there is a progressive adaptation and integration into western society. These forces operate differentially, both between individuals and groups, and, within them, at varying times.

In attempting to define the rôle of the beerhalls in the social and family life of Johannesburg's black population, we first needed to establish the traditional-western orientation of the community. Thereafter we would delineate the drinking and leisure patterns and the extent to which the beerhalls featured in these patterns. Finally, we would attempt to assess whether the beerhalls were beneficial or detrimental to the community.

In 1961, when the study was undertaken, the Native population of Johannesburg totalled 593,997. Of this number, 172,398 lived in compounds, hostels or on their employers' premises and were rurally-rooted workers whose families resided in the tribal areas. The remainder of the population consisted of family units resident in dormitory townships. These townships, which, as required by law, are situated apart from the European area of Johannesburg, form a satellite town covering 26 square miles. At their nearest point, they are 7 miles distant from the city centre. The majority of breadwinners in these townships work in the city and commute daily.

At the time of the study, the beerhalls constituted the only legal source of supply of an alcoholic beverage to the majority of Natives in Johannesburg. The development of the Johannesburg beerhall system requires to be related to the provisions governing the distribution of liquor to Natives. When the mining-camp of Johannesburg was established in 1886, there was no discrimination between Europeans and Natives in

access / ...

access to liquor. Subsequently, due to a variety of factors, drunkenness among Natives became an acute problem and, in 1902, virtual prohibition for Natives in Johannesburg was introduced. The immediate consequence thereof was an illicit liquor trade. Several government commissions were instructed to investigate the problem and the means to eradicate it. Eventually, in 1923, legislation was enacted enabling local authorities to provide for the supply of kaffirbeer to Natives either by permitting home-brewing, or themselves undertaking its manufacture and supply or a combination of both. Few local authorities, however, acted upon this legislation and in 1937 amending legislation compelled them to make such provision. The Johannesburg City Council opted for the municipal monopoly system, the profits of which accrue to the Native Revenue Account which finances all local social services for Natives.

The first beerhall was established in Johannesburg city in 1938. In the townships the first was erected in 1957. By 1961 there were four town beerhalls and twenty-two township beerhalls. The beerhalls are rectangular enclosures with shelter provided by verandah-style roofing projecting from the enclosing walls. The beverage exclusively dispensed is kaffirbeer, a brew of low alcoholic content and the traditional drink of the South-eastern Bantu. In general, the beerhalls attempt to recreate, within urban limitations, tribal drinking conditions. The on-consumption facilities are available to men only, but both sexes have access to off-sales divisions. In addition, legislation passed in 1927 provided for the issue of Letters of Exemption to Native men who could satisfy a magistrate that they had attained a European standard of living. These Letters of Exemption enabled their holders to purchase specified quantities of liquor from bottle stores. An insignificant section of the community was able to avail itself of this provision. A third legal source of liquor was available to residents in the two government townships\* in the Native residential complex. These residents were permitted to brew kaffirbeer for home consumption.

Despite /...

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\* Local authorities are required by law to provide accommodation for Natives legally within their boundaries. In 1954 however, the government decided to remove all Natives from a township which, as a result of urban development, was adjacent to a European suburb. To facilitate their removal, at a time when the Johannesburg City Council was hard pressed to remedy an acute housing shortage, the government erected two townships.

Despite these legal outlets, large-scale illicit liquor activities continued. On-consumption and off-sales facilities for the sale of alcoholic beverages, ranging from European liquor to all varieties of brews, were provided by innumerable 'shebeens' \* Finally, in August, 1962, nearly a year after the completion of the survey, the sale of all liquor through the licensed trade was extended to Africans.

To obtain factual and attitudinal material on current drinking and leisure behaviour, aspirations associated with these patterns and the uses made of the beerhalls, 683 men and 322 women resident in the municipal\*\* townships were interviewed. A stratified sample in terms of income and occupation was aimed at and the selection procedure achieved greater representation of the upper levels in the population than would have resulted from random sampling. Subsidiary material was obtained from interviews with Superintendents of townships and beerhalls and through observations in beerhalls and shebeens.

#### SOCIAL COMPOSITION AND STRATIFICATION

Sociologists generally agree that there are social divisions in all societies, although variation occurs between societies in regard to the bases and complexity of such differentiation. These divisions are frequently associated with discrimination in rôle and function and linked with behavioural and value differences. Other studies have established that considerable differences exist between the leisure and drinking norms of the various sub-sections of a community (Haer (3)). Hence, to give meaning to the drinking and leisure behaviour of Johannesburg's black population and to predict its future trends, we need to define the composition of our sample and the nature and extent

of its /...

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\* 'Shebeen' refers to any premises on which liquor is dispensed illegally.

\*\* The study was confined to the townships administered by our sponsors, the Johannesburg City Council.



of its social differentiation. As we have already stated, this community represents a society in transition and, in order to assess its character and direction, we require to relate it, both to the traditional society of its origin and to the western society with which it is interacting.

The structure of traditional South-eastern Bantu society was relatively simple. Social divisions were based on sex, age and rank, primarily related to hereditary status. A major factor associated with this simplicity of organisation was the relatively undifferentiated subsistence economy with an absence of occupational diversity and uneven distribution of wealth. The society was pastoral and hoe-cultural. The extended family constituted the primary social and economic unit, and work organisation, which was communal, was based on this unit. Preparation for economic and social functions was mainly informal and achieved through participation from earliest years. The political entity was the tribe owing allegiance to a chief.

In contrast, modern western society is highly complex. Its economic systems may be based on private or public ownership of the means of production. In either instance, the industrial economy is specialised, leading to a multiplicity of occupations which are differentially rewarded. Residential settlements are predominantly urban, and the nuclear family has replaced the extended kinship group as the basic social unit. Training for adult economic and social rôles has been extensively formalised and is provided for by a variety of educational institutions. Social division consists of classes of people at varying levels of prestige and power. In general, specific relationships exist between the occupations, incomes and educational levels within classes, their values and behaviour patterns, and the prestige accorded each class. Social mobility of individuals from one class to another depends on the interaction of specific factors within each community.

Industrial communities have established themselves as the most technically advanced and economically productive forces in modern society and it would appear that, despite the retention of elements of indigenous culture, the current change in most underdeveloped countries will result in the emergence to similar forms of social organization. Within our present context we are concerned with the manifestation of westernization in terms of the components of urbanization, industrialization and social class differentiation. This is a restricted operational delimitation

selected /...

selected to illustrate the process of change in our sample community. It is further a simplification of an uneven and complex operation. However, it is needed to establish the direction in which this group is moving.

Contemporary socio-economic class stratification is a product of western urban industrialism and persists as stated by Warner (4) "... as one of the most important and significant sets of relations" in this society. However, with a society passing from a culture in which these relationships are alien, we have observed that the dimensions which indicate a man's ability to function adequately in the new milieu, occupation and income, are precisely those which are commonly used to demarcate social class differentiation. It would, therefore, appear that at the present stage of development, there is a fusion of one aspect of westernisation, namely indices of social class, with the total concept. However, we may assume that, as the process of westernisation continues and the major imperatives are accommodated within the new societies, social class stratification will develop as an independent aspect paralleling current growth in advanced western communities. Such stratification will no longer be a concomitant of westernisation, since it is assumed that this overall value system will have been absorbed and adapted according to the needs of the assimilating population.

In relation to the South-eastern Bantu the unevenness of change, which has been intensified by legal restraints, has resulted in differential advancement in terms of the major processes. Thus, within the Johannesburg community alone, considerable variation occurs. The majority of mine-workers, who constitute approximately 16 per cent of the adult male population, are rurally-rooted migrants dependent both on earnings from the mines and the product of their lands. A second major group, which predominates amongst hostel and non-mining compound dwellers, is rurally-rooted, but industrially committed. Finally, there is that section which is urban-based and industrially committed. By confining our sample to township residents, excluding hostel dwellers, we aimed to represent the last-mentioned section and thus limit the range of variation; secondly, we ensured the representation of sections which have undergone the greatest degree of change and whose behaviour may predict the overall trends.

Analysis /...

Analysis of the sociographic data obtained from our sample confirms that it represents an urban population in terms of prolonged urban residence and severance of rural links. Secondly, it reflects an industrially committed community, exclusively dependent on the incomes derived by breadwinners from employment in industry, commerce or service. Another indication of movement away from traditional society, is that all subjects are members of nuclear families resident in separate dwelling units.

The findings further establish that this community predominantly lives in poverty. Random sampling indicated that nearly 90% of breadwinners earn incomes below the Poverty Datum Line of R11-00 per week (de Gruchy (5)). However, in our selected sample this percentage was reduced to 66%. Ten percent of the sample earn incomes above the Effective P.D.L.\* or R17 per week, as compared to less than five percent in the total township population. Other demographic information obtained from the sample is that three-quarters of the men are manual workers, the largest single occupational category being composed of semi-skilled industrial and commercial workers. The remainder are predominantly professionals and white-collar employees, although proprietors and sales personnel are also represented. Nearly two-thirds of the women's sample are housewives not gainfully employed and the majority of women in employment are operatives and domestic workers. Professionals amongst the women are mostly nurses and teachers. Subjects with a high-school education constitute just over one-third of the sample. Two-thirds of the men's and three-quarters of the women's sample are under 45 years of age. More than four-fifths are church members, mainly of orthodox Christian and African Separatist churches. The tribes which predominate are Nguni and Sotho. Nearly all subjects are married.

Our sample therefore represents an urban, industrial, predominantly lowly-paid, manually employed population of minimal education, the majority of whom are under 45 years of age, married and church-going.

When we examine the interrelationships between income and occupation, which we have selected as indices of westernisation and social differentiation, we observe that they are of the same order as those in  
western /...

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\*It has been estimated that to maintain the standard on which the P.D.L. is based an income of half as much again is required. We have referred to this level as the Effective P.D.L.

western societies. Where differences occur, they appear to be associated with specific legal and social restraints imposed upon the Native community. Thus there is a close connection between high earnings and professional and white-collar status and between low incomes and semi-skilled and unskilled occupations. On the other hand, proprietors and salesmen are relatively low on the income scale, due, it is thought, to the restrictions on their activities, while skilled industrial workers, for whom limited training opportunities exist, have a high earning status.

When the indices are related to the other sociological items, we find that western education is a prerequisite for higher income and occupational status. Church membership, which may be regarded as an outward expression of movement into western society and as a social class indicator is further evidence of the operation of the two processes in our sample. Failure to make this move is found among the lower socio-economic group or, having converted, a higher percentage of them belong to African Separatist churches. As subjects move up the scale, they tend to be members of orthodox churches.

Age has emerged as an extremely important element. It links individuals differentially to the increased educational and occupational opportunities which occurred during and after the Second World War. Hence, it is subjects in the 35 - 44 year age category who are in the upper socio-economic strata, whereas the younger and older groups are found at the lower levels. However, there is evidence that, as the industrial experience of the younger subjects increases, they will find some opportunity for upward mobility. The older men, on the other hand, are unlikely to move further along the integration or social scales.

Tribal grouping was not found to have any specific connections with the other sociological factors. This may indicate the attrition of ethnocentricity and the emergence of new foci for group cohesions.

Having outlined the structure of our sample population, we now wish to examine its leisure and drinking patterns and the rôle of the beerhalls.

#### DRINKING AND LEISURE PATTERNS

To understand the drinking and leisure behaviour in the sample and to assess it in terms of the traditional-western and social class continua, we require to define the patterns of the South-eastern Bantu

and to /...

and to compare them with those of the major social classes in western societies. We have adopted as western reference groups the British working class at the beginning of the century and a prototype of contemporary middle class society. In turn, these patterns should be viewed against the universality of drinking behaviour in a wide range of communities both in an historical context and at various levels of development. According to Horton (6), the reason for the widespread use of alcohol lies in its intoxicating and tension-reducing properties. Thus alcohol is a means by which societies reduce the tensions which exist in differing degrees in all communities. Its significance as a tension-reducing agent within a given society will depend on the outlets and recreational needs and activities of that community. In societies which sanction the use of alcohol, drinking usually occurs during social intercourse and accompanies selected rituals.

Horton has also stressed the dangers inherent in the use of alcohol and refers to the controls societies impose on its use. These restraints are primarily directed to prevent disruption of other social functions, particularly productive efficiency. Due to variations between societies and classes these restraints operate differentially. The sharp division of time into working and non-working or leisure periods is a phenomenon of industrial society (Friedmann (7)). In pre-machine societies, including that of the South-eastern Bantu, there was no definitive demarcation between working hours and those not devoted to work. Instead there were broad cyclical divisions, dictated by the seasons, when the number of tasks increased or diminished. Secondly these tasks were of a relatively simple nature and drinking in the course of their performance was sanctioned, provided efficiency was not reduced below a required level. However, prolonged drinking in the form of beer drinks was confined to the season of minimal task-demands. It was at this time, too, that recreational activities, namely visiting and feasting, and ceremonial functions took place. Segregation in terms of sex and age was generally observed. Young married women, however, rarely participated in drinking, being restrained by domestic responsibilities and their role in the subsistence economy of the society. The older women, relieved of these functions by the operation of the extended family system, were recognised drinkers. Drinking was communal, a limited number of receptacles from which drinkers partook in terms of prescribed procedure being circulated in each group. The staple drink was kaffirbeer. Drinking behaviour was integrated into living patterns and, as such was unquestioned.

In /...

In western society with its routine divisions into daily, weekly and yearly working and non-working periods and the relative complexity of its industrial and commercial tasks, normal drinking is confined to non-working periods. Hence the work organization and requirements result in drinkers having relatively short periods in which to drink and be ready to resume work.

Rowntree (8) in his first study of York in 1902, describes the drinking and leisure behaviour of a working class community. In a period of minimal living standards, housing conditions, levels of education, stimulation of felt needs and recreational outlets, the patterns of the men predominantly consisted of drinking in public houses. Beer was the favoured choice, principally because, in terms of price and quantity, it enabled men to pass all their leisure time in this way. Women did not drink as a rule and rarely frequented public houses. They were occupied with household chores and their limited free-time was spent in church activities, visiting or entertaining family and neighbours. They were frequently resentful of the men's behaviour principally because of the money spent and the effects of inebriation.

In a contemporary middle class, higher living standards and levels of education as well as access to varied recreational facilities have resulted in a variety of leisure activities. Normal drinking is regulated, not only by work requirements, but also by those of other recreational pursuits. It generally takes place at home or in clubs and frequently consists of short potent drinks which are less time-consuming in producing the desired effect. Women in this class have access to labour saving devices and thus have considerably more free-time. They are able to participate with their husbands in leisure activities and, although consuming less, they frequently drink with men. They are rarely opposed to normal drinking by men and women.

When we examine our information on drinking and leisure we find a complexity of interrelationships. Our interpretation of the material is that, despite evidence of the retention of specific traditional attitudes and practices, the predominant trends are towards the adoption of western patterns.

One manifestation of western influence is the high proportion of male abstainers. In traditional society, such abstention would be aberrant, yet nearly one-third of the men in the sample are non-drinkers.

Their /...

Their reasons relate to health, religious principles and personal aversion. Over four-fifths of the women do not drink, principally because of personal aversion, only two percent referring to customary restraints. Further evidence of western industrial orientation is the high percentage of drinkers who refrain from drinking during work or work breaks. Their stated reasons reflect a western work committal and acceptance of western work standards. Another indication of this direction of change is the relatively high percentage of women who question and oppose the man's drinking behaviour. Such criticism illustrates a move from the traditionally accepting attitude to one of expressed disapproval. Their objections appear to arise from the stresses the men's behaviour imposes on them in the maintenance of their rôles as mothers and housekeepers in the new environment.

A set of attitudes which suggests the persistence of the traditional approach but which also reflects the needs of the transitional society, is the opposition of both sexes to women drinking, particularly in the company of men. As stated reasons for this opposition are equally divided between adverse effects on family life, such as neglect of the children and disruption of the home; and the undermining of the status of women and requirements of custom.

A final general observation is that three-quarters of the population, irrespective of social status, observe traditional rites. If we relate this finding to the high incidence of church membership in the sample, it would appear that there is considerable overlap of social and emotional needs.

When we turn specifically to drinking and leisure patterns, we find three such patterns in the population. In the first place, we have isolated a tradition-oriented minority composed of older subjects of both sexes at the lower end of the socio-economic scale who drink kaffirbeer from the municipal off-sales or illicitly brewed beer at home or at homes of friends. The men in this group appear to drink daily. The percentage drinking at the beerhalls is small and none drink at shebeens. The reason for this avoidance is that the traditional age clustering and privileges are not observed. This group, however, in addition to visiting, finds its recreation in religious and church activities, indicating some response to western pressures. In contrast, the behaviour of subjects in the highest socio-economic brackets in the sample reflects the greatest diversity of recreational pursuits. These, within the limits of the facilities available to the black population, and with one notable exception, approximate the patterns /...

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patterns of the western middle-class prototype. The men in this section drink less frequently than the other groups and prefer European liquor which many purchase with Letters of Exemption. Home is the favoured drinking place and a minority frequent the more select shebeens which resemble clubs. There is also a percentage of them who drink at the beerhalls and make use of the off-sales service. The major deviation from the prototype's patterns is the fact that we find the same high percentage of abstainers amongst the women in this group as obtains for the population as a whole. The proportion of women opposed to men drinking, however, is lower, principally because their drinking is majorly at home.

Finally, we have to examine the patterns and attitudes of the younger manual workers and their wives who constitute the majority of the population. The drinking and leisure behaviour of the men in this group is largely dependent on the beerhalls which they attend almost daily and where they spend a considerable portion of their week-end leisure-time. The impression gained, and since apparently borne out, is that, irrespective of the legal restrictions, their preference is for kaffirbeer.\* Financial implications may also be associated with this choice. Secondly, the beerhalls appear to provide satisfactorily for their leisure needs. These men participate in a minimal range of activities in their non-working periods, and their leisure-time aspirations relate to activities which would improve their material conditions but which are not primarily recreational in nature.\*\* Hence, in the beerhalls, these men seem to find the companionship and relaxation that has met the recreational needs both of traditional and nineteenth century British working-class man.

The observers report that although western-style individual drinking is practised in the beerhalls, the majority of frequenters maintain traditional procedures. They drink in large groups, circulating a limited number of receptacles from which each member in turn drinks. The groups,

composed/...

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\*The demand for kaffirbeer has not decreased since the operation of the liquor laws amendments.

\*\*Secondary lucrative jobs or making improvements to their homes were the most frequently expressed aspirations of the men in this group.



composed of township residents, appear to coalesce round common neighbourhoods. It is not clear whether this adherence to a specific traditional form is an attempt to recreate tribal conditions, or whether it has a differential meaning and, for some, no special significance.

A substantial minority of this section frequent 'shebeens' and it is likely that, despite the repeal of restrictive legislation, a proportion of this custom will persist. Drinkers who require after-hour service, or cheap, strong drinks in the form of illicit concoctions, will continue to use these outlets. For the majority, however, the beerhalls feature as the most important element in their drinking and leisure behaviour.

The women in this group appear to have little free time and their leisure behaviour consists of domestic and religious activities, visiting and entertaining. These are the women most strongly opposed to their husbands' drinking patterns, which involve journeying from beerhalls after dark, minimal participation in domestic activities and expenditure of much-needed money. In view of the current high incidence of assault and robbery in the townships, returning home after dark constitutes a real danger. The following is an excerpt from 'Drum' (9) Magazine referring to life in the south-western townships: "The bitter fact is that far too many of our own people have come to accept violent death and murderous assault as an inevitable part of life in the townships ..... without more than a murmur". The second objection is linked to the profound change in family composition, and the rôles and functions of individual members, occasioned by urban living and dependence on cash incomes. As stated previously, the extended family has been largely replaced by the nuclear unit with increased individual responsibility in a complex heterogeneous society. The marriage relationship has, to a considerable extent, to provide the supports previously obtained from group membership and predetermined relationships in a relatively homogeneous society. Finally, a minority of women object to the beerhalls on the grounds that they have interfered with the livelihood they obtained from the sale of homebrews.

In summing up the behaviour of this group it would appear that, in many respects, it resembles that of the working classes of York at the beginning of the century (Rowntree (8)). Thus for this section of the population, the rôle of the beerhalls approximates that of the English

'pub' /...

'pub' in that they provide facilities for men to meet and drink together during their leisure-time. In character, however, the beerhalls differ markedly from the 'pub'. In fact they do not appear to have developed a distinctive character of their own. Instead, they provide a frame within which a range of groups satisfy their drinking needs, for, in addition to the urban population represented in our sample, they are frequented by the rurally-rooted men in the community. The only sections which tend to avoid them are the emergent middle class and orthodox traditional minorities. Further, it appears, that not only did they meet the needs of the majority of the population during a period of restrictive legislative controls, but that they continue to do so now that these controls have been removed. The negative aspects of the beerhalls emerge in the women's assessment of them. An examination of their criticisms, however, leads to the conclusion that these negative aspects derive from the current leisure needs of the men and not from the existence of the beerhalls. Hence, restrictive measures, such as the closing of the beerhalls, would result in large-scale reversion to 'shebeens' and the persistence of those aspects in the men's drinking behaviour which are inimical to optimum family and community well-being.

The solution to the conflict between the sexes and the promotion of the community's welfare would, rather, appear to lie in the continuation and acceleration of westernization and upward mobility. We have established that, for the most part, the drinking and leisure patterns of the upper stratum of the sample are not dependent on the beerhalls. Hence, it can be expected that an increase in the proportion of the population moving into this stratum will lead to a diminution in the proportion dependent on the beerhalls.

Finally, we may anticipate change within social classes.

Rowntree (8), in his second study of York, refers to radical changes in the behaviour patterns of the lower classes between 1899 and 1936. He reports that improved living conditions and leisure facilities gave rise to diversification in leisure activities and diminished dependence on drinking and drinking establishments. As our study was not longitudinal, we were unable to obtain direct evidence of this process in the townships. However, reference by township superintendents to increased interest in gardening and home improvements when families are moved from shacks to homes with grounds, suggests such change.

Thus /...

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Thus it would appear that upward social movement and change within classes influence drinking and leisure patterns. The continuation of these processes in the townships, however, is dependent on a series of factors concerned with higher wages, improved housing, health, educational and transport facilities, increased occupational opportunities and extended recreational and mass-media amenities. It is assumed that, with the intensification of industrialism, the necessary development will be promoted and that the consequence of such development will be the growth of the upper stratum and expanding needs within the lower stratum. The logical results of this change would appear to be the attenuation of the usefulness of the beerhalls - as they now exist - and the substitution of different patterns of drinking and leisure activity.

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SACHS, HESSIE

The Role of Beerhaals in the Municipal Townships of Johannesburg. A social Psychological Study, First Report, and Second and Final Report. CSIR Contract Report 23/62, March 1962.

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