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THE EFFECTIVENESS OF LEGAL MEASURES IN THE PREVENTION OF ALCOHOL PROBLEMS

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INTRODUCTION

The purpose of this review is to assess the evidence bearing on the effectiveness of legal measures believed to have some primary preventive value with respect to the incidence of alcohol problems. Not considered are laws concerned solely with such special segments of the drinking population as incorrigible alcoholics, public inebriates and impaired drivers. The focus is on legislation and derivative measures aimed at the whole population of consumers (or potential consumers) of alcohol, and intended to prevent the occurrence of alcohol problems through regulation of the amount or character of alcohol consumption.

There is a vast literature on the topic. In addition to the assessments of historians, physicians, clergymen, jurists, journalists and others, there are many official government reports. For example, in England there have been enquiries roughly once every 20 years since the Select Committee published its findings in 1834. In Canada and the U.S.A. there are reports of federally instigated enquiries, and of countless provincial or state bodies concerned with the merits and demerits of the control systems in their jurisdictions. While some of this literature contains data worthy of further analysis, most of it contributes little of value to the present concern. Typically, the conclusions are based on the personal tastes or beliefs of the authors, on ex cathedra arguments, or on the weight of

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opinion of persons with little or no direct knowledge of the matters at issue. In short, scientifically acceptable attempts to evaluate the effects of particular control measures are rare.

There are probably many reasons for a dearth of scientific studies, perhaps not least among them, the formidable methodological difficulties involved (Room 1971). However, a factor of particular importance has been the rise of the 'disease concept' of alcoholism. The view that normal drinkers and alcoholics comprise two quite separate groups within the population - which this notion has meant to many workers - has rendered meaningless or at least of low priority the consideration of measures intended to affect the prevalence of alcoholism through the general regulation of alcohol consumption. The drinking of the alcoholic is seen to be independent of other drinking: a symptom of pathological factors peculiar to him, and therefore, not amenable to change by measures which would affect the normal drinker.

In recent years, evidence has been accumulating which casts serious doubt on the validity of so narrow a concept of alcoholism. Moreover, it has been shown that the overall level of consumption in a population may well play a crucial role in the prevalence of hazardous drinking (Popham et al. 1975a). As a consequence, the possible preventive value of legal measures has again become an important issue, and the current status of knowledge respecting their effectiveness, worthy of review.

CONTROL OF OUTLET FREQUENCY

Perhaps no single control measure has been more frequently and widely employed over the centuries than the regulation of the number of places in which alcoholic

beverages may be purchased (King 1947; Krout 1925; Shadwell 1915). Outlets for on-premise consumption have been particular targets, and the immediate aim most commonly has been to reduce their frequency. While from time to time those who influenced the legislators had objectives in mind other than the prevention of insobriety (Lee 1944; Lemert 1962; Odegard 1928; Popham 1962), the latter has been typically the stated justification.

In an attempt to evaluate the probable consequences of alterations in outlet frequency, Popham et al. (1975a) studied the covariation of outlet rates and various indices of the prevalence of alcohol problems. These investigators reported that, among the provinces and certain larger cities in Canada, higher rates of arrest or conviction for drunkenness seemed to occur where there were fewest public drinking places per unit of population. Trends through time in Ontario also suggested something of an inverse relationship (Popham 1962). A possible explanation is that where or when there are fewer taverns - particularly of those catering to drinkers of the lower social strata - there will be fewer places to become drunk unobserved by the police, and a greater likelihood of heavy drinking in public areas (Ahlström-Laakso 1971). An apparently negative association between drunkenness charges and outlet rates was also reported for the United Kingdom (Mass Observation 1943). However, Popham et al. (1975a) ran a linear correlation analysis on two other U.K. series: figures for 84 county boroughs and for 52 counties excluding boroughs. The coefficients of correlation, although negative, were very small and not significantly different from zero.

Equally extensive legal statistics on drunkenness have not been studied for the U.S.A. However, coefficients of correlation between tavern rates and per capita

alcohol sales, and tavern rates and alcoholism prevalence estimates (in effect, liver cirrhosis death rates) for 49 states proved readily attributable to chance (Ibid 1975a). With respect to other types of outlet in the U.S.A., Entine (1963) concluded that limiting the number of package stores did not reduce off-premise consumption. On the other hand, Simon (1966a) found per capita sales to be related positively to the frequency of such stores, but felt on further analysis that this variable was more likely to be dependent on sales than the reverse.

It would seem clear that in the populations examined, variations in indicators of the prevalence of alcohol problems were not dependent on outlet frequency. It is important to emphasize, however, that the variations considered ranged from situations where outlets were ubiquitous to those where some customers may have been mildly inconvenienced.

Rather different results emerge when the effects of control measures which create or alter situations of extremely low accessibility are considered. The classic instance on one side of the question is Prohibition when, in several countries, the frequency of legal outlets was reduced virtually to zero. There can be little doubt that during the first few years of Prohibition in Canada (Popham 1956), Finland (Bruun et al. 1960), and the U.S.A. (Jolliffe and Jellinek 1941; Warburton 1932) all indicators of alcohol consumption and alcohol problems reached the lowest level yet achieved in any period for which there are relevant data. It is also clear that in later years - say roughly 1923-1933 in the U.S.A. - as an illegal trade became well established and the speakeasy and other clandestine outlets made their appearance - consumption increased substantially (Warburton 1932).

At the opposite extreme is the effect of a change in control policy which renders

alcoholic beverages readily accessible to a population previously isolated from a legal supply. The outcome of Kuusi's experimental introduction of outlets to 'dry' areas in rural Finland, or of Amundsen's study of a similar change in Norway suggests that, under these circumstances, there is an appreciable effect on consumption (Amundsen 1965; Kuusi 1957). However, the increase observed in the Finnish experiment was apparently offset in part by a decline in the consumption of illicit alcohol.

Mäkelä (1971a) has reported a more dramatic effect in Finland following a very considerable and rapid rise in number of outlets, many of which were established in previously 'dry' areas. In 1969 medium strength beer was released for unrestricted retail distribution, and shortly thereafter, apparent alcohol consumption in the country increased by 48%. Beer accounted for most of the increase. Although effects on other indicators of the prevalence of alcohol problems have not been reported as yet, Mäkelä (1971b) showed that the increase tended to be spread over the drinking population in a manner which inevitably brought about an increase in the proportion of heavy consumers.

REGULATION OF TYPE OF OUTLET

This area of control, which has been a subject of much debate and legislative action over the years, concerns such matters as the physical arrangements, mode of sale, class of beverage, and amenities which should be allowed in outlets for on- or off-premise consumption. Generally, the objective of control has been either to minimize the attractions of alcoholic beverage outlets, or to produce exactly the opposite effect: in both cases apparently in the belief that excessive consumption would be discouraged (Popham et al. 1975b).

An example of legislation intended to increase the attractiveness of on-premise outlets is found in Ontario when, in 1947, the sale of wine and distilled spirits by the glass, dancing, professional entertainment and other innovations were permitted. Previously, public drinking places had been confined to the sale of beer and very few recreational facilities were allowed. Popham et al. (1975a) analyzed trends in alcohol statistics for eight-year periods before and after these changes. By way of control data, the trends were compared with those in an adjacent province, where no significant changes in policy had occurred. It was found that, with the exception of liver cirrhosis mortality rates, the percentage increases were much greater in both provinces before than after 1947. From 1947 to 1954, alcohol sales increased slightly more in Ontario than in the control province, but drunkenness conviction and liver cirrhosis death rates showed greater increases in the latter.

Bryant (1954) examined the consequences of a similar change in the State of Washington, but could find no evidence to attribute increases in consumption or alchol-related offences to the change in control policy. And in Saskatchewan, Dewar and Sommer (1962) were also unable to discern significant effects in a before-and-after study of a small community in which a "beer parlor" for men only was replaced by a beer and wine tavern catering to both sexes.

To date, the only study of the effect of differences in type of package outlet appears to be that of Smart (1974a) who compared self-service and clerk-service stores in Toronto. In the former, all beverages offered for sale were displayed; in the latter, a selection had to be made from a list and the choice obtained through a clerk. The self-service type had more customers, and they were observed to

buy more than the customers of the clerk-service store. When interviewed, the clientele of the former more often reported unplanned purchases or "impulse buying", and those who did so, also reported a higher average consumption of alcohol during the preceding week.

It would appear from the few studies available that limited diversification of on-premise outlets may have little or no effect on trends in consumption or alcohol problems. On the other hand, if the results of a single study in one locality can be considered indicative, the application of "supermarket techniques" to the package retailing of alcoholic beverages may lead to greater consumption.

CONTROL OF HOURS OF SALE

The opening hours of alcoholic beverage outlets - especially those for on-premise consumption - have been almost as common a target of regulatory measure through the ages as their frequency (King 1947; Shadwell 1915). In the past, the legislation has commonly provided for a reduction in hours of sale with the stated intent of combatting the problems of insobriety. Shadwell (1923) considered this to have been a more effective approach in the United Kingdom than reductions in outlet frequency. However, despite long-standing beliefs in the efficacy of the measure, there have been exceedingly few attempts to put the matter to test.

Popham (1962) found an apparent correlation between the opening hours of on-premise outlets in Toronto and the hourly pattern of arrests for drunkenness exhibited between 8.00 a.m. Monday and 8.00 a.m. the following Sunday. However, when arrests were plotted for the period 8.00 a.m. Sunday to 8.00 a.m. Monday morning - during which time all beverage outlets were closed - an almost identical pattern emerged. This might be taken to indicate that the hours of sale reflected

the drinking pattern of at least one segment of the community rather than the reverse. On the other hand, the opening hours which prevailed at the time of the study had been in force for many years, and originally may have shaped the characteristic circadian pattern observed.

The results of a study in Victoria, Australia would suggest the latter to be the more probable relationship. There, Raymond (1969) examined the effects on motor vehicle accidents of an extension in the closing time of on-premise outlets from 6.00 to 10.00 p.m. She found no change in the overall total of personal injury accidents, but there was a marked change in the hourly pattern. After the extension of closing time, the previous accident peak between 6.00 and 7.00 p.m. altogether disappeared, and was replaced by a new peak between 10.00 and 11.00 p.m. From the results of this study, one would conclude that changes in closing hours can have a significant effect on pattern of consumption. But the total consumption or, at least, the frequency with which patrons consume impairing amounts may remain unaffected.

LIMITATIONS OF DRINKING AGE

Most jurisdictions have sought through legislation to limit or prevent the use of alcohol by persons below a specified age. As in the case of other restrictions discussed, there are divergent opinions respecting the desirability and effects of age limits, and very little objective data upon which to base a rational judgment. Some consider that the law should seek to postpone the introduction to alcohol as long as possible. Others feel that age limits (especially when high) encourage clandestine drinking by the young, and reduce the likelihood that healthy attitudes towards alcohol use will be learned (Wilkinson 1970).

By way of a preliminary examination of the effects of a change in age limit, Schmidt and Kornaczewski (1975) studied trends in alcohol sales and motor vehicle accidents before and after a reduction in the minimum age in Ontario from 21 to 18 years. It was found that the reduction in age limit was followed by a substantial rise in the consumption level of the 18 to 20 age group. There was also a distinct increase in the involvement of the age group in alcohol-related motor vehicle accidents; nor could this be attributed to an alteration in enforcement practice. A similar consequence of a reduction in legal drinking age has been reported for several states in the U.S.A. (Douglass et al. 1974).

It would be important to extend the period so far covered by these studies to determine whether or not the new levels of consumption and accident involvement persist. But in any case, the findings cast doubt on the contention that age limits do not exercise a restraining influence, or that their reduction may lead to a decline in alcohol problems.

PRICE CONTROL

Measures affecting the price of alcoholic beverages have been among the earliest forms of control imposed by law. However, the original objectives were to prevent over-charging rather than over-drinking, and most particularly, to secure revenue for government (Catlin 1931; Krout 1925). It was not until the rise of substantial Temperance agitation, especially during the early years of the present century, that heavy taxation was often justified as an effective way to combat insobriety and protect the health, morals and stability of society (Shadwell 1923).

Today there are probably no jurisdictions, where alcoholic beverages are legally sold, which do not impose some tax upon them. This has continued to be seen as

a lucrative source of revenue for the state. But taxation is now rarely justified as a protective measure, and indeed, in many jurisdictions tax increases have lagged behind income levels so that, in effect, the economic accessibility of beverage alcohol has been steadily increased (Popham et al. 1975a).

Recently, Lau (1975) reviewed the evidence of an association between the price of beverage alcohol and apparent consumption. He found that, despite some methodological differences and shortcomings, econometric studies for a variety of countries have consistently shown price to be a significant predictor of the demand for alcohol. With respect to the association between price and the prevalence of alcohol problems, the evidence is also persuasive. In the first place, such an association would be expected as a logical extension of the established co-variation of liver cirrhosis death rates and per capita alcohol sales (Popham 1970). Secondly, confirming evidence has been obtained through direct studies of the interrelations of the three variables. Thus, Seeley (1960) analyzed temporal data for Ontario and found a strong inverse relationship between a measure of price and both per capita alcohol sales and liver cirrhosis death rates. With few exceptions, a similar relationship was found by Popham et al. (1975a) in an extension of Seeley's analysis to regional and temporal data for several North American and European jurisdictions.

This is not to say that economic accessibility fully accounts for the observed variation in indices of consumption and alcohol problems. It seems to be a powerful determinant, statistically speaking, and one with clear implications for the development of effective preventive measures. However, the level of acceptance of drinking also appears to exert a strong effect on the indicators mentioned (Jellinek 1960; Seeley 1962). It is probable that the two factors are to some extent interdependent:

where there is a high level of acceptance, there is apt to be a high degree of economic accessibility, and conversely low accessibility may be associated with low acceptance. On the other hand, this is certainly not always the case. For example, the Republic of Ireland is clearly a high acceptance area (Bales 1946). Nevertheless, the apparent consumption level and the prevalence of alcohol problems are estimated to be relatively low (Blaney 1967; Lynn and Hampson 1970). This is in accord with the high price of beverage alcohol relative to the average income level of the Irish (Walsh and Walsh 1970).

Finally, there is the important question as to whether or not the inference of a cause-effect relationship from correlational data is justified. This is often likely to present a difficulty in the type of epidemiological study which has been reviewed. Definitive experiments will seldom be possible for practical, political and ethical reasons. However, if the associations are consistently encountered in both regional and temporal series for different populations, if the range of variation in the indices is substantial, if trends through time have been in both directions, and if the character of the relationship is in accord with expectation based on established knowledge, then the circumstantial case is a very strong one. This would seem to apply reasonably well to the evidence of economic accessibility as a determinant of rates of alcohol consumption and alcohol problems.

DIFFERENTIAL TAXATION

Traditional beliefs that alcoholic beverages differ in their effects on behaviour - by implication for reasons other than the amount of alcohol involved - are widely encountered, with variations in detail from one culture to another. Probably the most influential, with respect to control measures, has been the belief that beer is

a drink of moderation and that the problems of alcohol can be atrributed mainly to the use of distilled spirits. This has been the explicit justification in many jurisdictions for the imposition of substantially higher taxes on distilled beverages than on any other class (Jellinek 1963).

Currently, the arguments most frequently used in support of a tax differential favoring beer relate to acute effects potentially relevant to accident causation, and rest on the early work of Goldberg and his associates. Their experiments demonstrated that a higher peak blood alcohol level, and corespondingly greater psychophysical impairment were achieved after the ingestion of distilled spirits than after ingestion of the same quantity of alcohol in beer (Isaksson, 1957). However, Kalant et al. (1975) showed that, under more realistic experimental conditions which included progressive drinking, these inter-beverage differences altogether disappeared. In any event, no direct evidence has been obtained as yet to implicate one beverage over another in accidental injury or death.

Takala et al. (1957), in an experiment conducted in Finland, found that subjects were more prone to violence when the same blood alcohol level was reached through drinking spirits than when reached through beer. Since in Finnish culture there is a well-known pattern of explosive intoxication associated with the concentrated consumption of spirits (Kuusi 1948; Sariola 1956), their results may have been a function of a difference anticipated by their subjects. If so, this would not make the difference any less real, but it would tend to shift the etiological focus from pharmacological action to variables in culture and personality.

Turning to the evidence of chronic ill-effects, cross-national epidemiological studies have failed to find convincing evidence to indict any one class of beverage

over another (de Lint and Bronetto 1966; de Lint and Schmidt 1971; Popham et al. 1975a). Morbidity and mortality studies have indicated that the class of alcoholic beverage consumed is probably of little significance in the typical illnesses and higher rates of death of heavy drinkers (Lelbach 1974; Schmidt and Popham 1975). As to clinical alcoholism, examination of the literature reveals that beer has been implicated frequently (Ledermann 1964; Lelbach 1967; Skala 1967; Wilkinson et al. 1969). Indeed, the beverage preferences of alcoholics seem to reflect simply the preferences characteristic of the population in which they live, with a distinct tendency towards the cheaper sources of alcohol (Devrient and Lolli 1962; Lolli et al. 1958, 1960; Parreiras et al. 1956; Sadoun and Lolli 1962; Terry et al. 1957).

If a sound rationale for differential taxation does not reside in a differential liability of the various beverages to generate alcohol problems, it may yet exist in quite another direction. In at least two countries - Canada and the Republic of Ireland - the demand for beer has been shown to be largely price inelastic (Lau 1973; Walsh and Walsh 1970). This means that if there were a substantial increase in the price of beer, the previous consumption level would likely be maintained, presumably at the expense of something else. Walsh and Walsh (1970) pointed out that a consequence for low income families might be neglect of nutritional or other necessities. The possibility of such an effect would have to be weighed against the likelihood that differential taxation will ultimately result in the substitution of beer for the more costly sources of alcohol, and thereby negate the preventive effect sought.

In this regard, the experience of Denmark is of special interest. An extreme

high tax in 1918, levied only on distilled beverages, led to a very sharp decline in the consumption of these beverages, and a parallel drop in indicators of alcohol problems (Nielson and Strömgren 1969). However, the decline in use of distilled spirits was eventually replaced by a rise in the consumption of beer. In recent years, overall alcohol sales per capita have been the highest in Scandinavia and the prevalence of alcohol problems - at least as reflected in the liver cirrhosis mortality rate - is again substantial (Popham et al. 1975a).

In summary, there is little evidence to justify differential taxation on the grounds that beer is a comparatively harmless beverage of moderation while distilled liquor is a comparatively harmful beverage of excess. Pragmatically, however, it would seem that the imposition of a high tax on distilled spirits can lead to a decline in alcohol problems. But the effect may be temporary with eventual substitution of less expensive beverages. Uniform price control, on the other hand, might be expected to prevent substitution, but may have undesirable consequences, especially for low income families, owing to the demand inelasticity of one or another beverage.

THE MONOPOLY SYSTEM OF CONTROL

It has been widely believed that when the alcoholic beverage trade is in the hands of private enterprise, competition inevitably leads to practices which stimulate greater consumption and, consequently, a higher prevalence of alcohol problems. Proponents of this view have, therefore, favored a system whereby the state or its official agency maintains a monopoly of the whole or a significant part of the trade.

Following the repeal of Prohibition in North American jurisdictions, all provinces of Canada and about a third of the states of the United States adopted a government

monopoly system. In the remaining states, the alcoholic beverage trade was given over to private enterprise with control exercised through licensing. Jellinek (1947) analyzed trends within the states under each system for the period 1930 to 1945. He could find no evidence of an effect on "rate of inebriety", and with respect to trends in apparent consumption, noted that "the monopoly system did not prevent fairly large increases; nor did the license system lack small increases" (p. 16). Popham et al. (1975a) examined differences between the two groups of states for the year 1964. Higher mean rates of liver cirrhosis mortality, total alcohol sales and sales by type of beverage were exhibited by the license group, although only the difference for wine sales was statistically significant. Recently, Andreano and Li (1974) conducted a similar comparison but employed the male cirrhosis death rate, which may be a more sensitive index of differences in the prevalence of heavy drinking. They found the mean rate to be significantly higher in the license states. However, neither of these studies controlled for income level which, on the average, is higher in license than in monopoly states (Simon 1966b), and known to be an important determinant of the demand for alcoholic beverages.

It must be emphasized that to contrast monopoly and license states in the U. S. A. is not to compare 'control' with 'no control', nor even to compare areas where competition for private profit is largely absent with those where it is rampant. Among both license and monopoly states there are important differences in the extent to which emphasis is placed on the revenue-producing rather than the problem-controlling function of the system (Barker 1957; Landis 1948; McCarthy and Douglass 1959; Simon 1966b). Therefore, a better test of the effectiveness of the latter would be to disregard the official classification and base the comparison on relevant differences

in operation independently validated.

Certainly in the past there have been monopoly systems which clearly had the control of alcohol problems as a primary objective (Popham et al. 1975b; Smart 1974b). In some instances, these have involved attempts to monitor individual use, prevent consumption beyond a specified level, and exclude identified problem drinkers from purchasing. The effectiveness of such systems has rarely been studied, and never with conclusive results, so far as the present writers are aware. The Bratt system in Sweden is a case in point (Elmer 1957). It was abolished in 1955 and replaced by a far less restrictive form of monopoly control. According to Boalt and von Euler (1959), the change was followed by a rapid initial increase in alcohol sales, drunkenness arrests and impaired driving. But by 1958, apparent consumption had dropped below the 1954 level. However, since substantial tax increases had been imposed by that time - which could have been responsible for the decline - no conclusion could be drawn from the post 1955 trends as to the relative effectiveness of the two systems of control.

It may be, as Christie (1965) has suggested, that when a state monopoly is rather comprehensive, and a primary objective is prevention, alcohol problems are less prevalent than they otherwise would be. But then the question becomes whether or not the particular measures which prove effective could not be applied equally well under a licensing system. Presumably under a monopoly, both the number and potential political influence of those with a vested economic interest in higher levels of alcohol consumption is less. It would also seem that the implementation and enforcement of various types of control measure, and the monitoring of their effects are facilitated by a centralized system. However, the overriding consideration is prob-

ably the emphasis which the controlling authority places on the preventive aspect. When the control of alcohol problems has become secondary to marketing and distribution objectives, a state monopoly system may function, in effect, as a particularly powerful ally of the alcoholic beverage industry.

EPILOGUE

There would appear to be agreement among students of law and drinking behaviour on at least three points: (1) highly restrictive controls on accessibility lead to lower consumption and fewer alcohol problems; (2) such controls are unlikely to be implemented in the absence of substantial public support; and (3) such controls are apt to involve costs which eventually will be perceived to outweigh their benefits (Bruun 1970; Christie 1965; Lemert 1962; Mäkelä 1972; Room 1971; Shadwell 1923).

It is also increasingly recognized that the corollary of these conclusions is true: "liberalizing the system leads to an increase in consumption, and an increase in consumption adds to the complications" (Mäkelä 1972 p. 21). Indeed, minimum control may well carry as high costs as very severe restriction. For example in France, where there have been few legal restraints on drinking, and the highest known consumption level of any country has prevailed, it has been estimated that over 40% of the total health bill is attributable to the treatment of alcohol-related diseases, and about 50% of all hospital beds are occupied by patients suffering from these conditions (Brésard 1969). It is significant that France seems to have been the only Western country in recent years to introduce new and far-reaching restrictive measures in an effort to reduce consumption (Fleck 1970). The trend elsewhere

has been in the opposite direction.

Doubtless many factors are responsible for the widespread relaxation in alcohol control policies during the post World War II period. However, three are evidently of particular importance. One of these, mentioned at the outset of the review, is the rise of the 'disease concept' of alcoholism. This has led many to the belief that whatever may influence the demand of most people for alcohol will be irrelevant to the demand of the alcoholic. A second factor has been the unrealistic expectation in the past of the ability of the law to solve alcohol problems. Thus, the 'failure' (i.e., adverse consequences) of Prohibition and other highly restrictive legislation is still often cited to buttress arguments against legal measures with far more modest aims. But perhaps the most powerful influence on the trend has been the rise of increasingly permissive attitudes towards individual rights and the control of behaviour. This has led to the denigration a priori of legal restraint, and a search instead for means of prevention consistent with the thrust towards self-determination in areas of social concern.

An outcome, especially in North America, has been the adoption by many of a model of prevention which envisions rather fundamental changes in attitudes and behaviour respecting alcohol use. These changes are to be achieved mainly through education and parental example. Legal measures tend to be seen as impediments to the development of healthy drinking habits. It is felt by at least some proponents of the model that rendering alcohol readily available to everyone from an early age, and allowing its introduction into all areas of everyday life, will reduce the mysticism associated with it. Alcohol will then come to be regarded as no more remarkable than any other consumer product, and therefore, will be used moderately.

It is difficult to reject, in principle, a goal which is not a little reminiscent of the view that everyone should be taught a healthier life style in order to reduce or eliminate many chronic ailments. No doubt utopic ends are worthy of pursuit, but it is questionable whether this is a sound justification in the interim to promote changes quite probably detrimental to public health, or to oppose measures of potential benefit. In this regard, we cannot do better than conclude with Edwards' (1971, p. 424) succinct statement on the matter: "Since we are not able to manipulate personality and produce a race with no neurosis, the only realistic method of exerting a benign influence on the prevalence of alcohol addiction is by control of the environmental conditions of drinking, and it is the availability element that remains the prime candidate for control."

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CONTROL LAWS AND PRICE MANIPULATION AS PREVENTIVE STRATEGIES

by

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CONTROL LAWS AND PRICE MANIPULATION AS PREVENTIVE STRATEGIES

J. de Lint and W. Schmidt*

Our task this morning - to discuss control laws and price manipulation as preventive strategies - would have been eased somewhat if, in the past, many of these measures had clearly been intended to reduce or prevent the incidence of some specific alcohol problem, be it drunkenness, chronic excess, physical dependence on alcohol, or ill health and other forms of damage usually attributable to occasional or chronic excess, and if, subsequently, the efficacy of these measures with regard to these objectives had been carefully investigated. Unfortunately - with a few exceptions - neither is the case (1).

We are also well aware of the fact that the issue of government control in the area of alcohol use is politically highly sensitive. Not only is the production and distribution of alcoholic beverages of considerable economic importance in many countries, also beverage alcohol is a very versatile and popular food consumed at quite different occasions (Table I). Changes in government controls would therefore affect a large number of consumers, as well as a significant sector of the

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economy. Thus, added to the relative scarcity of good data, we must take into account that questions concerning control laws are much in the public domain and tend to arouse strong feelings. It is not sufficient to merely assess the available evidence related to the effect of a specific measure on the incidence of an alcohol problem, we must also be prepared to consider public reactions to policy recommendations derived from such research.

Before commenting on the evidence and the preventive strategies implied, we might first ask the question why so many control laws überhaupt exist in the alcohol field. In view of the sensitivity of this issue, why is it that we do not rather find a laissez-faire attitude on the side of government? Probably one of the most important reasons for the enactment of control laws is that alcohol intoxication frequently leads to socially undesirable behavior. Other reasons include to secure revenue for the state, to prevent fraudulent or harmful practices on the part of the producer and distributor, to protect public health, and to restrain political activity that might occur among groups of men drinking in taverns. But, in our view, the overriding concern reflected in control policies of recent date has been social welfare, that is, the minimizing of socially undesirable behavior.

Elsewhere we assessed in detail much of the evidence related to the efficacy of alcohol control laws and taxation policies (2). We have concluded that some of these control measures are indeed highly relevant to the prevention of alcohol problems. Of course, in the general area of population research it will rarely be

possible to produce findings that can establish a case beyond dispute. Those who oppose certain alcohol control laws and taxation policies will undoubtedly exploit some of the methodological difficulties inherent in research of this sort (3). In this context it should be noted that our policy recommendations were formulated in terms of high probability rather than of certainty of effects.

Control laws and taxation policies

In the case of control laws the overall impression one gains from the literature is that minor variations in the density, location and type of outlet, in the hours and days of sale or in many of the other regulations governing the context in which drinking takes place (e.g., the decor, seating arrangement, entertainment offered) have no measurable effect on the incidence of occasional excess and other alcohol problems. On the other hand, some of the more dramatic changes in control laws that have occurred apparently did affect the incidence of alcohol problems. For example, the sudden expansion in the number of on- and off-premise outlets after Prohibition in the U.S.A., the opening of stores in isolated dry areas in Finland and Norway, the rapid rise in number of outlets in Finland in recent years following the release of medium strength beer for retail distribution, lead to noticeable increases in the rates of alcohol consumption and alcohol problems in these jurisdictions.

In the case of taxation policies, econometric studies have shown fairly consistently that alcoholic beverages - in

spite of the wide variety of their uses - tend to behave on the market like many other commodities (Table II). Thus, as prices have fallen the consumption of alcoholic beverages generally increased, and in the few instances where prices increased sharply the demand decreased. However, the price effect varies noticeably between different types of beverages, countries and regions which illustrates one of the major difficulties inherent in both the econometric analyses of the price effect on alcohol problems as well as in the studies of the efficacy of other control laws. Beverage alcohol - unlike many other commodities - has a wide variety of usages, e.g., dietary, medical, ritual and social. Each of these use patterns may have quite different demand elasticities and the proportionate occurrence of each usage may vary considerably over time, space or cultural group.

For instance, in recent years there has been a rather rapid diffusion of new drinking styles into societies which traditionally had low to medium levels of consumption (4). In many societies where alcohol use was largely restricted to a few social occasions and involved only one or two of the major types of beverage alcohol, we now find that alcohol use occurs more frequently and involves all the major types of beverage alcohol. Indeed, if we consider the changes in consumption levels by type of beverage we note that beer consumption rose very rapidly in countries where alcohol use

patterns involving beer were practically non-existent, alcohol use patterns involving wine are now much more prevalent in countries where wine consumption used to be relatively rare, and distilled spirits have been marketed quite successfully in countries where traditional usage of this type of alcoholic beverage was virtually absent (Table III). It would seem, therefore, that one of the underlying assumptions in econometric analyses, namely that the behavior of the market tends to be constant and that the type of needs for alcohol do not change to any significant extent, is not always justified.

A second difficulty in the study of the efficacy of alcohol control laws and taxation policies is that the enactment, repeal, relaxation and tightening of such measures is rarely an isolated event. For example, in Canada during the last decade many changes have occurred. There has been an increase in the number of outlets, new types of drinking places are now permitted, hours of sale have been extended, drinking age has been lowered, the real cost of alcohol has gone down, some restrictions on alcohol advertising have been removed. At the same time a wider variety of use patterns have now been accepted in a more sophisticated and affluent Canadian society. In short, many of the etiologically relevant cultural, economic and legal factors tend to be quite closely related in time and therefore their separate effect, if any, on the incidence of alcohol problems is virtually impossible to

ascertain.

In our report on the effects of legal restraint on drinking many of the other methodological difficulties inherent in evaluative research in the field of alcohol control policies are discussed. Again, it would be hazardous to state that a specific change in a control law or in taxation will result in a given effect on the rate of an alcohol problem. At the same time we wish to emphasize that over the last two decades or so, in most Western countries a steady and at times rapid increase in alcohol consumption and alcohol-related problems has occurred together with a relaxation of many control laws and a decrease in the cost of alcohol (Table IV). Only in France where a determined effort has been made towards restricting alcohol availability (e.g., by reducing the frequency and location of outlets, removing the private distiller's license, raising alcohol taxes) do we find a decrease in alcohol consumption rates and in deaths from liver cirrhosis that began 5 to 6 years ago (5, Table V). Although we are quite well aware of the reasons why these relationships should be interpreted with due caution, the sum total of the available evidence suggests very strongly that, in all low to medium consumption countries, whenever beverage alcohol became more readily available - because of lowering its real cost and/or because of a relaxation in control laws - levels of alcohol consumption and rates of alcohol problems showed a tendency to increase.

Policy recommendations

Accordingly, the Addiction Research Foundation made the following proposals to the Ontario Government:

1) A taxation policy which maintains a reasonably constant relationship between the price of alcohol and levels of disposable income (income after taxes) in the Province. For example, if disposable income per capita rose 5% in a year, then the price of each alcoholic beverage offered for sale would be increased by that percentage.

2) A moratorium on further relaxation of alcohol control measures and the adoption of a health-oriented policy with respect to such measures. Essentially, this would mean that future proposals to change legislative or other provisions governing the marketing and distribution of alcoholic beverages would be tested against a health objective, namely the prevention of further increases in the prevalence of alcohol problems. The relevant question would become: Are the proposed changes likely to contribute to higher consumption levels and therefore to an increase in health costs?

3) An education program designed to increase public awareness of the personal hazards of heavy alcohol consumption, the economic and other consequences for society of high consumption levels, and the potential public health benefits of appropriate control measures.

Incidentally, in the most recent Report of the WHO Committee on Drug Dependence, quite similar recommendations are made to governments (6). Although in our view the aims of these proposals are quite modest - many impediments to their implementation can be anticipated.

Impediments to a public health oriented alcohol policy

First, alcohol use at many different occasions is now quite common and there appears to be little public awareness of the consequences to health of increased consumption. Indeed, many of the newly integrated drinking patterns are considered to be rather sophisticated and quite harmless.

Second, the rapid diffusion of a wide variety of alcohol use patterns into societies with traditionally low levels of consumption has been facilitated by the very efficient marketing efforts of large and often multi-national industries. Also, these industries have been selectively quite active in the field of alcohol research and education. For example, the House of Seagram distributes, in Canada, free of charge, the pamphlet "Alcohol and Alcoholism: Problems, Programs and Progress", a booklet originating with the National Institute on Alcohol and Alcoholism in which any association between legal controls, volume of consumption and rates of alcoholism is denied (Appendix 1).

Third, as I mentioned earlier, no matter how much evidence can be marshalled to support the above proposals, there is no doubt that to a purist the many studies which have led to these proposals all have some methodological shortcomings. In many areas of life style research this is unavoidable. But, since government control of drinking is politically a sensitive and controversial issue, these weaknesses tend to be exploited by the adversaries of such controls while the degree of consistency in the available evidence tends to be ignored.

Fourth, the raison d'être of many control laws in the recent past was the social welfare responsibility of governments and not their concern with public health. That some of the same Temperance-tainted control measures which aimed at curbing drunkenness among the poor are now being proposed as public health measures aimed at protecting the health of the affluent may not be easy to explain.

Fifth, some key concepts in the public health approach to alcohol problems, such as the contagious aspects of use patterns, and the risks to health and dependency related to different consumption behaviors will also be difficult to disseminate.

A sixth impediment to the implementation of these proposals would be the existence of several quite popular notions about alcoholism which have been cultivated in recent years by both enlightened educators and the alcohol industry. Examples: alcohol problems are rooted in having ambivalent attitudes towards drinking; the consumption of wines and beer is less likely to lead to alcohol dependence.

Seventh, there is the legislators' perception of the public reaction to the reactivating of restraints on alcohol availability. Although the results of a few recently conducted surveys would seem to indicate that a surprisingly large segment of the population is quite willing to drink less and to pay higher alcohol taxes if these actions would reduce the rates of alcohol problems, legislators may not be aware of the extent of public support for legal restraints (7). In this context it should be noted that the news media often present a very liberalizing and biased point of view regarding alcohol control laws.

Postscript

There is little doubt that these and other factors may seriously delay, if not prevent, the implementation of alcohol control policies which place renewed emphasis on restraining availability. As I mentioned before, the issue of alcohol controls is politically highly sensitive. But the urgent facts are that, in North America, as well as in most other parts of the Western world, alcohol consumption has been steadily increasing over the recent past. Not only are more people drinking now, but their consumption has gone up as well. Drinking occasions have become more numerous, and alcohol use has more and more become an integral part of our daily life. These developments have had a measurable effect on the rate of such alcohol problems as health damage and physical dependence

on alcohol. In our view, these trends should be monitored and regularly brought to public attention. Although the responsibility of government in the area of alcohol control is not well defined - how much alcohol use is to be tolerated at what cost - it is certain that the present government policies of making alcohol more accessible and less expensive relative to disposable income will definitely not result in a stabilization of the prevailing trends towards higher rates of consumption and alcohol problems.

NOTES AND REFERENCES

1. One of these exceptions concerns the problem of intoxication while driving an automobile. Several measures have been specifically designed to reduce the magnitude of this problem and their efficacy has been the subject of many investigations. For instance:

   Ross, H.L. The effectiveness of drinking and driving laws in Sweden and Great Britain, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, Toronto, Sept. 8-13, 1974, Addiction Research Foundation, in preparation.

2. Popham, R.E., Schmidt, W. and de Lint, J. The effects of legal restraint on drinking. In: Biology of Alcoholism Vol. IV: Social Biology, (B. Kissin & H. Begleiter, Eds.). Plenum Publ. Corp., New York, in press 1974.

3. For example:
   Beer, Wine and Spirits: Beverage Differences and Public Policy in Canada, The Report of the Alcoholic Beverage Study Committee, Brewers Association of Canada, Ottawa, 1973.

4. Ahlström-Laakso, S. European drinking habits: A review of research and some suggestions for conceptual integration of findings. Paper presented at the Conference on Anthropology and Alcohol Studies, Chicago, Aug. 28-30, 1973.

5. Fleck, L. The twelve-year struggle against alcoholism in France. In: World Dialogue on Alcohol and Drug Dependence (E.T. Whitney, Ed.). Beacon Press, Boston, 1970.

6. The 20th Report of the WHO Expert Committee on Drug Dependence, World Health Organization, Geneva, 1973.

7. For instance. in Ontario, the results of a recent survey on social control and alcohol attitudes, conducted by the York University Survey Centre, indicate that more than half of the respondents are willing to pay more for alcoholic beverages if this would reduce the number of alcoholics. More than 70 per cent of drinkers said they would be willing to drink less if this would eventually lead to a reduction in the rate of alcohol problems*. In another recent survey, conducted by the Liquor Control Board of Ontario, it was found that a vast majority of the interviewees are against a further relaxation of alcohol control laws in the Province**.

* Goodstadt, M. et al. Survey on social control and alcohol attitudes in Ontario, Addiction Research Foundation, in preparation.

** Ministry of Corporate and Community Affairs, personal communication.

TABLE I

WORLD PRODUCTION OF BEER, WINE AND DISTILLED SPIRITS IN HECTOLITRES 1960 AND 1970[1]

Year	Beer[2]	Wine[3]	Distilled Spirits[4]
1960	411,000,000	247,000,000	12,165,000
1970	638,000,000	309,000,000	20,066,000

1 Hoeveel alcoholhoudende dranken worden er in de wereld gedronken? Produktschap voor Gedistilleerde Dranken, Schiedam, the Netherlands, 12e Uitgave, 1973

2 Production data available for 113 countries.

3 Production data available for 51 countries.

4 Production data available for 28 countries.

TABLE II

INCOME AND PRICE ELASTICITIES OF DEMAND FOR DIFFERENT ALCOHOLIC BEVERAGES IN A NUMBER OF COUNTRIES*

Author	Country and time period	Beverage	Income Elasticity**	Price Elasticity***
Malmquist	Sweden 1923-1939	Spirits	0.3	-0.3
		Wine	1.2	-0.9
Malmquist	Sweden 1923-1939	Liquor	0.3	-0.37
		Wine	1.32	-0.72
Sundström & Ekström	Sweden 1931-1954	Spirits	0.9	-0.3
		Wine	2.0	-1.6
Bryding & Rosen	Sweden 1920-1951	Spirits	0.6	-0.4
		Wine	0.9	-1.6
		Medium Beer	0.6	-1.2
Huitfeldt & Jorner	Sweden 1956-1968	Off-sale:		
		Vodka	0.0	-0.9
		Other spirits	1.4	-2.9
		Fortified wines	0.2	-0.7
		Light wine	-	-0.6
		Strong beer	1.9	-3.0
		Spirits	0.4	-1.2
		Wine	(0.9)	-0.7
		Spirits + Wine	0.7	-1.0
		On-sale:		
		Vodka	1.0	-0.3
		Other spirits	0.2	-0.5
		Strong beer	2.0	-0.1
Nyberg	Finland 1949-1962	Vodka	0.42	-0.13
		Other spirits	1.30	-0.95
		Wines	0.97	-0.83
		Malt beverages	0.23	-0.49
		Total off-sales	1.05	-1.17
		Total on-sales	0.94	-0.99
		Total sales	1.01	-1.11
Stone	United Kingdom 1920-1938	Spirits	0.6	-0.6
		Imported wine	1.4	-0.6
		Domestic wine	1.7	-0.3

TABLE II cont'd.

Author	Country and time period	Beverage	Income Elasticity**	Price Elasticity***
Stone	United Kingdom 1920-1938	Spirits	0.54	-0.72
		Beer	0.14	-0.73
Walsh & Walsh	Ireland 1953-1967	Spirits	1.94	-0.57
		Beer	0.78	-0.17
Simon	United States 1955-1961	Spirits	-	-0.97
Niskanen	United States 1934-1954	Spirits	-	-1.74
Niskanen	United States	Spirits	-	-1.42
Niskanen	United States 1934-1941, 1947-1960	Spirits	-	-2.0
Schweitzer	Canada	All alcoholic beverages	0.88	-0.19
Lau	Canada 1949-1969	Spirits	0.68	-1.45
		Wine	1.43	-1.65
		Beer	0.20	-0.03

* Österberg, E. The pricing of alcoholic beverages as an instrument of control policy, Finnish Foundation for Alcohol Studies, Helsinki, 1974.

** The income elasticity values indicate the percentage increase in consumption that would result from a 1 per cent increase in income.

*** The price elasticity values indicate the percentage decrease in consumption that would result from a 1 per cent increase in price.

TABLE IIIa

THE 1960 AND 1970 TOTAL ALCOHOLIC BEVERAGE CONSUMPTION
PER CAPITA 15 YEARS AND OLDER IN LITRES OF ABSOLUTE ALCOHOL
(WITH PERCENTAGE INCREASES)

Country	1960	1970	% change 1960-70
France	27.32	23.98	-12.23
Italy	19.05	20.73	8.82
Spain	11.89	16.89	42.05
Luxembourg	13.75	16.21	17.89
W. Germany	10.15	16.04	58.03
Portugal	15.32	15.72	2.61
CSSR	10.38	14.55	40.17
Switzerland	12.58	14.52	15.42
Austria	10.85	13.29	22.49
Belgium	11.71	13.21	12.81
Hungary	9.15	12.95	41.53
Australia	9.45	11.68	23.60
N. Zealand	9.49	11.02	16.12
E. Germany	7.29	10.47	43.62
Yugoslavia	6.79	10.36	52.58
U.S.A.	7.83	9.74	24.39
Denmark	6.11	9.70	58.76
Canada	7.85	9.58	22.04
Gt. Britain	6.80	8.32	22.35
Sweden	5.86	7.94	35.49
Netherlands	3.82	7.81	104.45
Poland	6.16	7.52	22.08
Rep. Ireland	4.90	7.27	48.37
Finland	3.87	6.33	63.57
Norway	3.56	4.37	22.75

TABLE IIIb

THE 1960 AND 1970 DISTILLED SPIRITS CONSUMPTION PER CAPITA
15 YEARS AND OLDER IN LITRES OF ABSOLUTE ALCOHOL
(WITH PERCENTAGE INCREASES)

Country	1960	1970	% change 1960-70
Poland	3.62	4.42	22.10
Yugoslavia	2.61	4.03	54.41
U.S.A.	2.99	4.01	34.11
W. Germany	2.45	3.95	61.22
Spain	2.76	3.95	43.12
Canada	2.57	3.56	38.52
Hungary	1.88	3.43	82.45
E. Germany	1.77	3.41	92.66
Sweden	2.95	3.34	13.22
CSSR	1.32	3.09	134.09
France	2.74	3.01	9.85
Netherlands	1.64	2.82	71.95
Finland	1.86	2.41	29.57
Switzerland	2.06	2.41	16.99
Luxembourg	1.60	2.30	43.75
Italy	1.26	2.24	77.78
Rep. Ireland	1.09	2.11	93.58
Austria	3.07	1.85	-39.74
Belgium	1.01	1.73	71.29
Denmark	.83	1.66	100.00
Norway	1.71	1.56	-8.77
N. Zealand	1.47	1.54	4.76
Australia	1.19	1.46	22.69
Gt. Britain	.99	1.20	21.21
Portugal	.71	.70	-1.41

TABLE IIIc

THE 1960 AND 1970 WINE CONSUMPTION PER CAPITA 15 YEARS AND OLDER IN LITRES OF ABSOLUTE ALCOHOL (WITH PERCENTAGE INCREASES)

Country	1960	1970	% change 1960-70
Italy	17.44	17.74	1.72
France	20.68	16.82	-18.67
Portugal	14.40	14.09	-2.15
Spain	8.37	10.26	22.58
Switzerland	5.65	6.53	15.58
Hungary	4.81	5.75	19.54
Luxembourg	4.76	5.72	20.17
Austria	3.18	4.93	55.03
Yugoslavia	3.70	4.49	21.35
W. Germany	1.65	2.70	63.64
CSSR	2.18	2.30	5.50
Belgium	1.22	2.19	79.51
Australia	.91	1.54	69.23
Sweden	.51	.97	90.20
N. Zealand	.38	.97	155.26
Poland	.82	.93	13.41
Denmark	.49	.93	89.80
Netherlands	.33	.85	157.58
U.S.A.	.59	.83	40.68
E. Germany	.48	.79	64.58
Canada	.37	.73	97.30
Finland	.22	.65	195.45
Gt. Britain	.25	.46	84.00
Norway	.20	.37	85.00
Rep. Ireland	.16	.28	75.00

TABLE IIIa

THE 1960 AND 1970 BEER CONSUMPTION PER CAPITA 15 YEARS AND OLDER IN LITRES OF ABSOLUTE ALCOHOL (WITH PERCENTAGE INCREASES)

Country	1960	1970	% change 1960-70
W. Germany	6.05	9.39	55.21
CSSR	6.88	9.16	33.14
Australia	7.35	8.68	18.10
Belgium	7.32	8.63	17.90
N. Zealand	7.64	8.51	11.39
Luxembourg	7.39	8.19	10.83
Denmark	4.79	7.11	48.43
Gt. Britain	5.56	6.66	19.78
Austria	4.60	6.51	41.52
E. Germany	5.04	6.27	24.40
Canada	4.91	5.29	7.74
Switzerland	4.08	5.08	24.51
U.S.A.	4.25	4.90	15.29
Rep. Ireland	3.65	4.88	33.70
Netherlands	1.72	4.00	132.56
Hungary	2.46	3.77	53.25
Sweden	2.40	3.63	51.25
Finland	1.79	3.27	82.68
France	2.40	2.71	12.92
Spain	.76	2.68	252.63
Norway	1.65	2.44	47.88
Poland	1.72	2.17	26.16
Yugoslavia	.48	1.84	283.33
Portugal	.21	.93	342.86
Italy	.35	.75	114.29

TABLE IV

THE COST OF 1 GALLON OF ABSOLUTE ALCOHOL IN THE FORM OF WINE, BEER AND DISTILLED SPIRITS EXPRESSED AS A PERCENTAGE OF ANNUAL PER CAPITA DISPOSABLE INCOME, CANADA 1950, 1960 AND 1970.

Year	Wine (%)	Beer (%)	Distilled Spirits (%)
1950	3.36	3.16	6.30
1960	2.87	2.58	4.73
1970	2.28	1.83	3.39

TABLE V

LIVER CIRRHOSIS MORTALITY RATES AND PER CAPITA ALCOHOL CONSUMPTION, FRANCE 1950 TO 1972

Year	Deaths from liver cirrhosis per 100,000*		Per capita consumption in litres of abs. alc.
	Male	Female	
1950	21.53	12.05	19.86
1951	25.28	14.64	20.36
1952	29.67	17.54	20.75
1953	34.05	19.75	20.72
1954	36.82	20.77	20.89
1955	39.47	22.16	21.42
1956	41.74	22.88	21.34
1957	40.40	20.33	21.33
1958	37.34	17.43	20.07
1959	37.41	17.30	20.19
1960	39.87	18.40	20.12
1961	41.88	19.02	20.26
1962	43.84	19.42	19.73
1963	45.30	19.79	19.98
1964	46.20	20.07	20.18
1965	47.99	20.56	19.79
1966	49.91	20.91	19.61
1967	50.67	20.90	19.03
1968	50.41	20.79	18.61
1969	49.59	20.52	18.26
1970	48.81	20.30	18.28
1971	48.82	20.38	18.24
1972	48.93	20.37	18.30

* Centered moving averages

APPENDIX 1

The Toronto Sun, Wednesday, July 18, 1973

The latest information on ALCOHOLISM can be yours, free of charge

We have a very important and informative booklet which we think will interest you. And it's free of charge. It's all about the disease of alcoholism. Experts tell us that it's one of the finest things ever written on the subject. But we don't need to be experts to understand it. Its 42 pages are written in simple layman's terms so that we can all clearly grasp its meaning.

It would be great if every thinking Canadian could read this booklet. It's written for everyone, even those who have no problem with alcoholism and just want to learn something about the disease. And, of course, it's also written for those who, through no fault of their own, may be alcoholics and are unable to control the amount or extent of their drinking. Anybody with a friend or relative with this serious health problem will also find this booklet to be an invaluable source of down-to-earth, factual information.

"Alcohol & Alcoholism – Problems, Programs & Progress" was written by the National Institute of Mental Health and the National Institute on Alcohol Abuse and Alcoholism, both of the United States. It was published under the auspices of the U.S. Department of Health, Education and Welfare and was printed originally by the U.S. Government Printing Office.

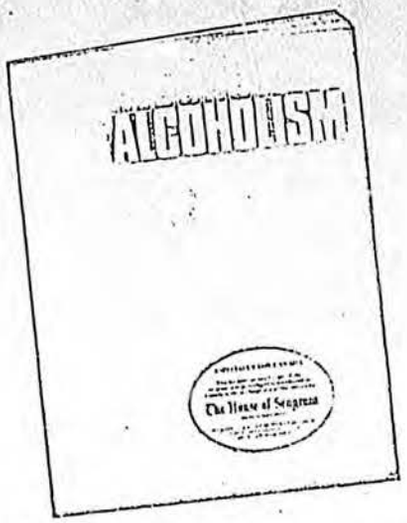
The booklet firmly establishes that alcoholism is a disease and not a behavioural defect or moral weakness. It makes clear that the problem is not one of drinking but of drunkenness and not of alcohol but of alcoholism. It further recognizes that the cause or causes of alcoholism are not yet known and that as of now there is no known cure for the disease, even though it is often treated successfully and its progress halted.

SUBJECTS COVERED

This immensely readable and informative booklet covers a broad spectrum of subjects. They range from the earliest recorded history of man's consumption of beer, wine and spirits to the most recent and advanced scientific thinking and the never-ending search for new knowledge. It pursues such subjects as understanding alcohol and its effects, problem drinking and alcoholism, the origins of alcoholism, overcoming alcoholism: diagnosis, treatment and prevention; legislation, organization and action and other related subjects.

PART OF A CONTINUING PROGRAM

Because this booklet is so important and so timely, and because its message is as relevant to Canadians as to citizens of the United States, we believe that it should be widely distributed throughout Canada. We decided, therefore, to do something about it. After distributing 5,000 copies, which we purchased from the U.S. Government, we obtained permission from that Government to print in Canada as many more copies as we require and to arrange for translation to French.



Copies of the booklet have already been sent, or are in the process of being sent, to members of the clergy, to all senators, federal and provincial members of parliament, members of the judiciary, to mayors of municipalities, senior civil servants, all newspapers and magazines, radio and television stations, liquor boards and commissions, labour leaders and union officials, alcoholism commissions, all university and other libraries, educators, all professors of medicine and medical doctors, all lawyers, and scores of other interested persons in every province and territory in Canada.

So far, we have received thousands of letters commending this project. These are gratifying, especially the large numbers from school boards and teachers across the country requesting extra copies which we've been pleased to send. We also have been favoured with hundreds of letters of approval from medical doctors and other scientists, and from medical schools, alcoholism commissions and numerous professional associations.

This is the first time that we've offered this booklet to the general public. And it won't be the last. As many Canadians know, our Company was first in our Industry to advocate moderation in its advertising. That was in 1934 and we have continued ever since. The distribution of this booklet, the most extensive of its kind ever undertaken in Canada, is another step in our continuing program directed toward increasing public knowledge of a serious social and health problem.

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PREVENTIVE MEDICINE 3, 24–35 (1974)

The Prevention of Alcoholism

JAN DE LINT

The Addiction Research Foundation,
Toronto, Ontario, Canada

Methods used by epidemiologists in the field of alcoholism, such as prospective, retrospective and coincidence type of investigations are described. These and other methods have indicated a close relationship between rates of alcoholism and levels of alcohol consumption. The problem of defining alcoholism, a behavioral disorder of a complex nature, is discussed and—for epidemiological or "counting" purposes—an operational definition of alcoholism as consumption in excess of daily averages of 15 cl of absolute alcohol is proposed. Results of follow-up studies of alcoholics have shown that alcoholics have a mortality rate at least twice that of the general population. It has also been estimated that in Ontario about 6% of total deaths are attributable solely to alcoholism. Data on alcohol consumption indicate that there is a distinct trend in many countries towards higher consumption levels, a consequence of a growing acceptance of so-called civilized, French-style drinking habits. Current epidemiological evidence suggests that preventive programs should aim at a stabilization of this trend. Some programs, such as prohibition and taxation are examined as to their relative impact on alcohol consumption levels and rates of alcoholism. It is recommended that governments adjust alcohol taxes as often as required to maintain a constant relationship between the price of alcohol and average disposable income. At the same time educational programs should emphasize the close association between overall levels of alcohol consumption, rates of alcoholism and alcoholism-related mortality. Finally, it is recognized that the gradual "alcoholisation" of our way of life is as much a political issue as it is a public health issue.

This Forum provides me with an opportunity to discuss the epidemiology of alcoholism, particularly where it applies to the development of programs of prevention.

Epidemiologists are scientists who study the mass aspects of diseases and behavioral disorders. One of their methods is to establish rates of occurrence of a disease or a behavioral disorder in different population groups and then to compare these rates through time or from one region to another (2,5,8,12,21,22,24,34,43,46,49,54,57,58,62). Alcoholism—unlike many other behavioral disorders, such as drug abuse—is quite well suited to this approach. Its characteristics—the repetitive intake of alcohol, usually in rather large quantities, and the various damaging consequences of such drinking—are reflected in various statistics regularly reported for most European and American jurisdictions; for instance, rates of liver cirrhosis mortality and sales of beverage alcohol.

A second method frequently used by epidemiologists is the so-called retrospective study. This method is to sample an afflicted population (such as patients in an alcoholic clinic) and collect information about habits and condition of life preceding their affliction (1,6,9,15,19,22,35,42,48,55,59,61,64).

A third method is to follow groups of persons differently exposed to conditions which are suspected of being disease-producing. This method has been particularly useful in describing the mortality and morbidity associated with the alcoholic way of life (3,7,10,13,14,16,17,20,31,32,37,39,41,51,56,60).

Alcoholism Prevalence and Consumption Averages

These epidemiological studies of alcoholism have yielded much information quite relevant to the problem of prevention. Foremost, the results of many comparative studies have demonstrated quite convincingly that rates of alcoholism rise and fall with overall levels of alcohol consumption. Wherever the overall level of consumption is high the alcoholism rate is high, wherever it is low the alcoholism rate is low.

Additional evidence for the apparently fixed relationship between the overall level of alcohol consumption and alcoholism prevalence has come from studies of the frequency distribution of alcohol use (24,28,29,33,44,50). It has been shown for a wide variety of populations that the distribution of drinkers, according to their individual consumption, closely approximates a smooth, skewed curve of the type known to mathematicians as a logarithmic normal curve. For instance, a frequency distribution of drinkers in a population with a yearly average of 15 liters of absolute alcohol, according to their individual consumption, would be as follows (Fig. 1):

However, in a population in which the annual consumption per drinker is higher, for instance, 25 liters of absolute alcohol, the frequency distribution curve takes a rather different form (Fig. 2):

You can see that the proportion of heavy drinkers who consume daily averages in excess of 10, 15, or 20 cl. of absolute alcohol is much larger in the latter population, and the proportion of drinkers who consume very moderate quantities of beverage alcohol much smaller.

Alcoholics are located in the tail end of these curves. However, the transition from moderate to excessive quantities is very gradual and, therefore, a definition of alcoholism on the basis of consumption quantities must be arbi-

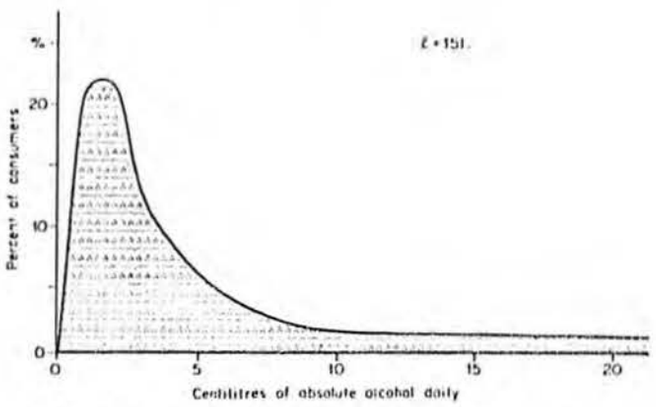


FIG. 1. Frequency distribution of alcohol consumption.

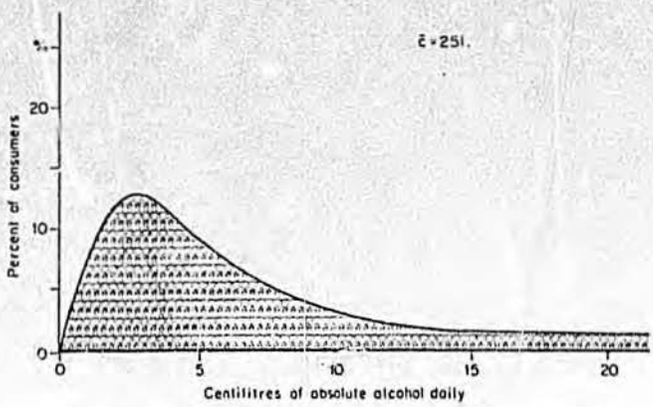


FIG. 2. Frequency distribution of alcohol consumption.

trary. At the Addiction Research Foundation we have defined alcoholics as drinkers who consume at the average daily quantities in excess of 15 cl. of absolute alcohol. This definition was justified on the following grounds:

1. Patients admitted to alcoholism clinics typically report daily consumption of averages ranging from 15 cl. of absolute alcohol to lethal amounts (26, 27,53,65).
2. Estimates based on this definition agree quite well with estimates based on the mortality experiences of alcoholic patients (50).

I should like to emphasize that this is a very arbitrary definition. Although it is not difficult to observe many behavioral and physiological differences between persons whose consumption places them at opposite ends in the distribution curve, the differences between persons consuming daily averages of 13, 14, or 15 cl of absolute alcohol are of course quite minimal.

But, whatever definition of alcoholism is used, our observation that the distribution of drinkers according to their individual consumption approximates a logarithmic normal curve means that alcoholism and other levels of consumption are inextricably linked. Therefore, it is not possible to reduce the rate of alcoholism without affecting the rate of other levels of consumption. The log normal distribution curve has also a number of other implications for alcoholism prevention:

First, the very gradual decrease in the number of drinkers with increasing amounts of alcohol supports the theory that alcoholism is a behavioral disorder different only in degree from "normal" drinking and not a discrete illness with a specific etiology. In this context I should like to mention that many psychological and biological studies have failed to find unique personality or constitutional features shared by all alcoholics. These results also affirm that alcoholism is a behavioral disorder different only to a degree from so-called "normal" drinking behavior (Fig. 3).

Second, if we look at two populations—one with an average annual consumption of 25 liters of absolute alcohol and the other with an average annual

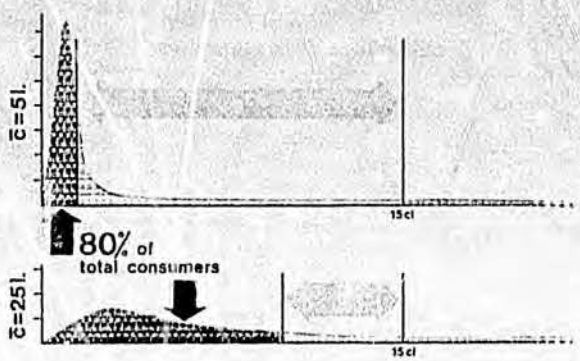


FIG. 3. Two frequency distributions of alcohol consumption.

consumption of 5 liters—you will note that in the low-consumption population the few who drink excessively deviate drastically from the drinking norm. This implies that alcoholism in such a population is not primarily a consequence of prevailing drinking customs but rather a behavior symptomatic of socio- or psychopathology. Conversely, in the high-consumption population alcoholism is a quite common behavior and does not deviate much from the drinking norms. Under such conditions alcoholism is less likely to be a manifestation of an underlying pathology.

Alcoholism-Related Mortality

Thus far I have dealt with the epidemiological observations and interpretations pertaining to the nature of alcoholism. Epidemiologists have also been much concerned with alcoholism-related mortality. Follow-up studies have compared the mortality rates in a sample of alcoholics with those in the population at large. The results have shown that mortality in alcoholics is more than twice the expected rate (3,14,16,37,41,51,56). Deaths observed in samples of excessive alcohol users are largely attributable to such causes as cardiovascular diseases, suicide, liver cirrhosis, neoplasms of the upper digestive tract and respiratory organs, pneumonia, alcoholism, and accidents (13, 14,17,31,37,39,41,51,56). The contribution of each of these causes to the total excess death is shown in Fig. 4.

To estimate the impact of alcoholism on overall mortality, I should like to quote a few statistics for the Province of Ontario, Canada. In 1969, 22,600 persons between the ages of 20 and 70 died. Of these, about 2430, or 11%, were alcoholics. If the rate of death of Ontario alcoholics were the same as in the general population, only about 1070 alcoholics would have died. It follows that, in Ontario, in 1969, the remaining 1360 deaths (or 6% of total deaths) were exclusively the result of alcoholism and the life style of the alcoholic.

Current Trends

Finally, before discussing the issue of prevention I should like to comment

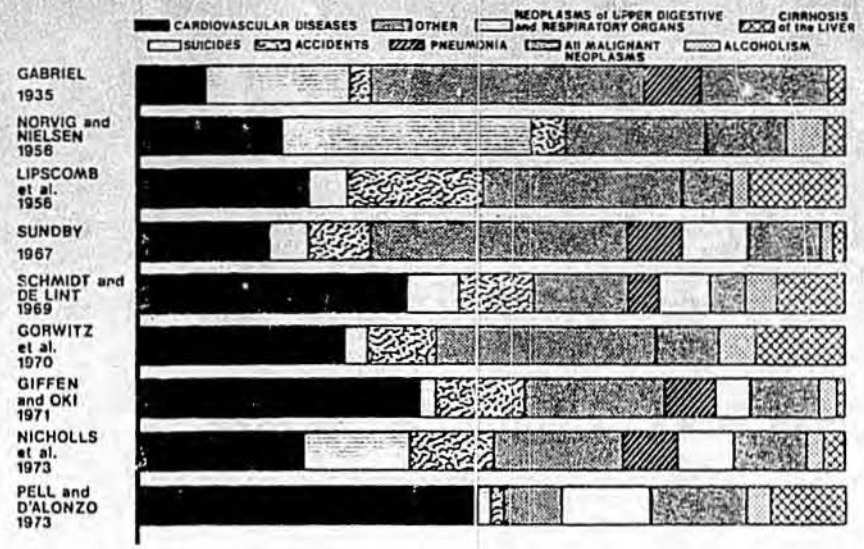


FIG. 4. Cause-specific mortality in samples of excessive alcohol users.

on the current trends toward higher levels of consumption. For many years France has had the highest rates of alcohol use and alcoholism. It has recently been estimated that 42% of its total expenditure on health is attributable to the treatment of alcohol-related diseases, and about 50% of all its hospital beds are occupied by patients suffering from such diseases (4). More recently, several other countries are rapidly approaching these high levels of consumption and these high rates of alcohol problems. For instance, West Germany, Italy, Austria, and Portugal are cases in point. Indeed, in many countries in the Western world a distinct trend in this direction is evident (Table I).

This trend toward higher consumption levels is a consequence of the growing acceptance of so-called civilized, sophisticated drinking habits—the frequent consumption of beverage alcohol at many occasions throughout the day, such as wine with meals, beer after work, cocktails before dinner. Eventually, alcohol use becomes an incidental part of many daily activities, and high alcohol consumption and alcoholism levels invariably result.

From a public health point of view I think it is quite evident that we must try to halt this trend and stabilize current levels of alcohol consumption. In the past, programs of prevention have included prohibition of the sale of alcoholic beverages, control of number and type of outlets, taxation of beverage alcohol, and alcohol education. I should like to discuss these programs now as well as some other issues relevant to the problem of alcoholism prevention.

Prohibition

On the issue of prohibition the late Sully Ledermann remarked: "If the quasi-mathematical connection between consumption averages and alcoholism rates cannot be broken and if one considers as an absolute priority

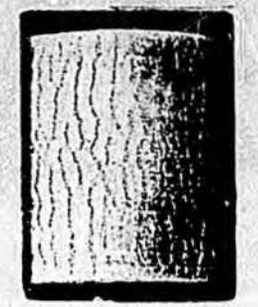
TABLE I
RATES OF EXCESSIVE ALCOHOL USE IN A NUMBER OF COUNTRIES
1960 AND 1970[a]

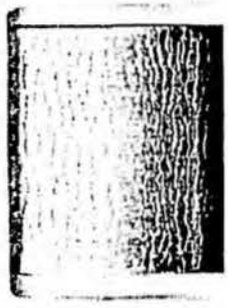
Country	Apparent consumption per drinker (c)		Rate of alcohol use in excess of 15 cl of absolute alcohol per 100,000 15 years and over	
	1960	1970	1960	1970
Australia	11.81	14 57	2,456	3,290
Austria	11.42	14.00	2,802	3,690
Belgium	12.33	13.92	3,078	3,650
Canada	11.14	11.83	1,988	2,460
CSSR	11.53	16.20	2,682	4,290
Denmark	7.65	10.79	1,448	2,470
E. Germany	9.12	12.27	1,776	2,760
Finland	5.53	7.94	882	1,500
France	28.76	25.56	11,267	9,050
Hungary	10.16	14.40	2,304	3,630
Italy	21.16	23.07	6,435	7,390
Luxembourg	17.19	17.96	4,160	5,000
Netherlands	4.78	8.62	872	1,870
N. Zealand	11.86	13.75	2,488	3,040
Norway	5.09	6.96	812	1,150
Poland	7.70	8.55	1,456	1,870
Portugal	16.12	16.55	4,484	4,690
Rep. Ireland	7.01	10.37	1,148	1,830
Spain	13.20	18.77	3,213	5,350
Sweden	7.33	9.95	1,368	1,990
Switzerland	14.68	17.22	3,493	4,420
Gt. Britain	9.71	11.08	1,673	2,130
U.S.A.	11.19	13.91	2,016	2,690
W. Germany	11.28	16.90	2,619	4,820
Yugoslavia	8.93	11.54	1,944	2,680

[a] (11, 18, 29, 50)

the elimination of alcoholism, there remains no apparent solution other than the suppression of alcohol in all forms in which it is consumed" (25).

However, in my opinion, public health programs in the field of alcoholism cannot ignore other important aspects of alcohol consumption behavior: in the first place, many of our drinking habits, such as the occasional use of beverage alcohol to enhance a festive event, as part of a religious observance, to promote sleep and relaxation, are quite pleasurable and harmless. Indeed, where such customs prevail consumption averages and alcoholism rates tend to be low. And secondly, in populations with low consumption averages the few who drink excessively deviate rather much from the drinking norm. Effective prohibition would eliminate their alcoholism but not the socio- or psychopathology manifested by such deviance.





Number and Type of Liquor Outlets

The effects of less drastic government control measures, such as those regulating number and kind of outlets, hours of sale, and other conditions related to the consumption of alcoholic beverages are difficult to evaluate (47). It is quite evident that in countries with a high level of consumption both public drinking places and stores in which alcoholic beverages can be bought are very numerous. Therefore, it is somewhat surprising that in North America and the United Kingdom no statistical relationship was found between trends in per capita consumption and the number of drinking places through time (47). However, in the period covered by these studies many other relevant changes occurred; for instance, a much larger proportion of alcohol is now consumed at home rather than on-premise, the average size of public drinking places has increased, the use of the automobile has become a way of life rendering the distance between the consumer and the outlet less important. Probably, for these reasons, changes in the density of outlets in North America and the United Kingdom did not have a measurable effect on consumption levels. But in rural Finland, where liquor outlets are quite rare, the introduction of government stores for beer and wine in some selected communities on a trial basis did bring about a marked increase in the consumption of all legally sold alcoholic beverages, particularly of wine and beer (47).

The regulation of hours of sale, particularly for on-premise consumption is also a widely practiced control measure. Evidence concerning its effectiveness is again quite ambiguous. Some investigators have claimed that the relatively low rate of consumption in the United Kingdom is partly attributable to restrictions in hours of sale. Others have suggested that similar regulations in Australia had the opposite effect and contributed to higher rates of intoxication and consumption. In Canada the extension of opening hours—introduced some years ago—had no noticeable impact on the rate of overall consumption.

Taxation

Perhaps the most widely used and the oldest method to control alcohol abuse has been taxation of alcoholic beverages. Indeed, during the 18th century debate in the Irish Parliament it was said that "It is the duty of the Legislature to make the means of intoxication as difficult to come by as they possibly can; this can only be done by laying duties as high as the article will bear." The effect of taxation has been examined for many countries and regions (23,36,38,40,47,54,63). In all cases it has been found to be related to the overall consumption and to prevalence of alcoholism. Indeed, we have not discovered a single country where the alcoholism rates were high in the presence of high relative price (the price of beverage alcohol relative to personal disposable income). However, in interpreting this finding we must recognize that the amount of alcohol taxation tends to reflect the degree of acceptance of alcohol use in society. Therefore, we should not attribute increases in the level of overall consumption and in the rate of alcoholism solely to decreases in the relative cost of beverage alcohol.

Something happens along nine-by stores in the "Bash"

Linda Brown
ABC Board

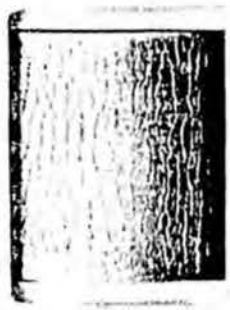
Old problem.

In recent years, the relative cost of beverage alcohol in Canada and several other countries has gradually decreased. This, undoubtedly, has facilitated the current trend toward higher levels of alcohol consumption. We have suggested to the government that, as a first step, it should adjust alcohol taxes as often as required to maintain a constant relationship between the price of beverage alcohol and average disposable income. Eventually, after an intensive educational effort, it may want to establish a somewhat higher relative price than the present one in an effort to reduce the current levels of alcohol consumption and alcoholism.

In the context of alcohol taxation epidemiologists have also examined the argument that the consumption of distilled spirits is more likely to lead to alcoholism than the consumption of lighter beverages and its sales should, therefore, be subjected to more legal restrictions and higher taxation than the other kinds of beverage alcohol. This argument draws support from the observation that the consumption of distilled spirits leads more rapidly to intoxication than the consumption of identical amounts of alcohol in the form of wine and beer. However, I should like to point out that only a little more time and effort are required to achieve intoxication with beer and wine, and—more importantly—no evidence exists to indicate that the speed at which intoxication is achieved is relevant in the development of alcoholism (47). Indeed, the beverage preference of alcoholics usually does not depart much from that of the drinking population at large. For example, in Australia and southern Germany, beer is the most commonly used beverage. According to clinical reports, it is also the beverage of choice of most alcoholics (26,65).

Other Government Control Measures

There are some governmental control measures in the alcoholism field which do not primarily aim at a reduction of alcohol availability and overall levels of alcohol use. Instead, their aim is to promote so-called desirable drinking practices (e.g., the use of beer and wine rather than the use of distilled spirits, drinking with meals) and to discourage undesirable drinking practices (e.g., public intoxication). Indeed, the Cooperative Commission on the Study of Alcoholism in the United States has recommended that the convivial use of beverage alcohol and drinking with meals should be encouraged, the so-called "beverage of moderation" (beer) should be stressed, and drinking should become an incidental part of routine activities (45). This recommendation ignores much of the epidemiological evidence concerning the etiological significance of levels of alcohol consumption in alcoholism. To promote the use of beverage alcohol as an incidental part of daily life, to encourage the introduction of so-called civilized drinking patterns, to favor the use of wine and beer, is to support the current widespread trend toward a saturation of our lifestyle with alcohol use. Unfortunately and ironically, the concern in low-consumption countries with the problem of occasional intoxication has sometimes led to the adoption of precisely such alcohol programs. In my view, the first priority in government control measures should always



be to reduce or stabilize alcohol availability and to prevent the acceptance of French-style drinking patterns.

I mentioned earlier while discussing alcohol taxation that the effectiveness and format of government control measures depend largely on the degree of acceptance of alcohol use in society. To modify the degree of acceptance of alcohol use is a difficult task indeed. I should like to deal now with some of the issues confronting the educator in the alcoholism field.

The Nature and Magnitude of the Alcoholism Problem

One of the most important and obvious tasks of an alcoholism education program is to disseminate as clearly as possible information about the causes of alcoholism and about its consequences. For example, it must be explained that alcoholism prevalence is determined by the extent to which alcohol use is integrated into the daily life of a people. Where alcohol is typically used at many occasions alcohol consumption levels and rates of alcoholism are high.

Such a program should also deal with many of the misconceptions regarding the nature of the alcoholism problem. For example, it is frequently argued that the problem of alcoholism is in the person and, therefore, the vast majority of drinkers who use beverage alcohol moderately should not be penalized—e.g., by high taxes on the sale of alcoholic beverages or other legal restrictions—for the disease or weakness of some. This argument ignores the epidemiological evidence regarding the social nature of the alcoholism problem. Each of us determines the extent to which alcohol use is to be part of our culture, our way of life. Indeed, studies on the distribution of alcohol use have clearly shown how the prevalence of alcoholism is closely linked with the prevalence of all other levels of consumption. For this reason the alcoholism problem must be considered well within the domain of public health and environmental hygiene.

Another misconception concerns the magnitude of the alcoholism problem. Many people wrongly assume that the probability of becoming an alcoholic is similar to the alcoholism prevalence rate.

Thus, if in a population about 2% of drinkers are alcoholics and if 98% of drinkers consume more moderate amounts, one may be inclined to argue that the likelihood of becoming an alcoholic is only 2%. This conclusion is incorrect. At the average, the duration of alcoholism is much shorter than the duration of all other use patterns combined. In the first place, rates of death, of hospitalization, and of incarceration are higher in alcoholics than in other drinkers. Secondly, the age of onset of an alcoholic lifestyle is much later than the age at which one becomes a drinker. Because of the difference between the average duration of alcoholism as compared to the average duration of all other forms of drinking, one's probability of becoming an alcoholic is considerably higher than the alcoholism prevalence rate would indicate.

Postscript

Finally, I should like to comment on the position of scientists and research institutes such as the Addiction Research Foundation of Ontario in the educa-

tional process. We can estimate the health costs associated with alcoholism, describe the effects of various levels of alcohol on the body and the mind, note such factors in the etiology of alcoholism as alcohol availability and the degree of acceptance of alcohol use. We may tabulate the extent to which the alcohol industry depends on sales to alcoholics or we may observe that certain government programs in low-consumption countries have had an adverse effect on rates of alcoholism (30,47,52). Whatever the nature of our contribution to the understanding of the problem of alcoholism and its prevention we cannot decide for the government how much alcohol use we are to tolerate and at what cost. Public health is a political issue. The Addiction Research Foundation has at several instances advised the government of Ontario about current world-wide trends in alcohol use, alcoholism, and alcoholism-related diseases and also about the desirability of bringing about effective control measures such as increased taxes on beverage alcohol. We have suggested to the government not to accommodate the increased acceptance of so-called civilized, continental drinking patterns. Thus far these efforts have met with little success.

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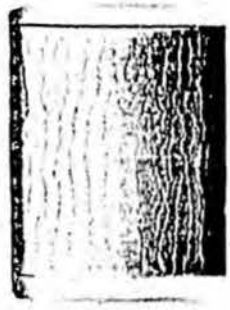

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