the "economic core" from the presently dominant narrow macro-micro theory to the general study of economic systems containing elements of organization, power, preferences, opportunities, ideas-systems, effective preferences and freedoms, etc.

The writer is fully aware of the fact that the proposed model for a broader paradigm has several inherent weaknesses and that, in considering the change, economists must also consider the "costs" involved in this change. But the scope of this paper is too limited to deal with objections to the model. This must be relegated to a more extensive research project.

It seems appropriate to close this paper with the assertion that the model of "specialized bohemia" proposed here is formulated in a spirit of "the search for a new explanatory mode that would reach across the artificial division of 'economics,' 'politics' and 'society' to produce a unified conception of society as a seamless web," the search "which would open up a topography of the social process more ramified than the one to which we are accustomed, thereby enabling us to comprehend the process of social change more thoroughly than is now possible."2


A Theory of Leisure
James R. Melvin

Introduction
Leisure has not been a popular topic of study in economics, and most of the analytical discussions which do exist have focused on the trade-offs between leisure and work.1 These discussions make no attempt to distinguish between available time and leisure, and leisure is viewed as a residual—the amount of time left over after work. This leisure is regarded as yielding utility and it is often assumed that at a high enough wage, workers will opt for more leisure and less work. This paper takes a somewhat different approach and views leisure as a commodity which must be produced like any other commodity, and where available time is only one of the necessary inputs. This draws attention to the fact that some available time may not be converted into leisure and that this "extra time" may be a "bad" rather than a "good". It is then argued that this may have serious social consequences, in which case the policy objective will be to minimize the amount of this "extra time". Attention is then given to the question of how this minimization can best be accomplished.

The rapid technological change which characterizes the modern world is bringing about a number of significant changes in the social ethic. One of these is the gradual erosion which is taking place in the philosophy that work has morally desirable characteristics in itself and that it is not socially acceptable to spend all or most of one's time in leisure activities.2 While this glorification of work may have been one of the factors which has given rise to the rapid improvement which has taken place in the standard of living in the last hundred years, it seems clear that this philosophy is on the way out. We find that the working day and the work week are becoming shorter and paid vacations are becoming longer, and it is quite possible that within the next few decades the average individual will work only five or six hours a day for three or four days a week.3 There

1This argument has a long history. As several examples, see Chartresworth (1964, 30), Cattell (1926, 27), Doebly (1938, 315), Giroue (1962, Ch. 2) and Mead (1938).

2Zeidel (1938, 145) reports that the work week has been reduced from an average of about 60 hours in 1850 to about 40 hours in 1950. Giroue (1962, 441) shows that in 1960 the average work week in all industries was 38.5 hours and was 36.0 hours in non-agricultural industries. Projections as to what the future holds vary. Clawson (1964, 12) has estimated that the work week will be 28 hours by 2000, while Douglas and Crawford (1964, 32) predict that by 2006 the industrial work week will be 50.3 hours. Newman (1959, 107) has calculated that if the trend in work week reductions continues for another hundred years, by 2009 the work week will be less than 15 hours. On the other hand, Wileskly (1961, 55) argues that such comparisons are misleading, for the 1870's represented a period in which the work week was much longer than it formerly had been. He estimates that today's skilled urban worker works about as long as his 13th century counterpart. He also draws attention to the uneven distribution of leisure and argues that while many work shorter hours, many others (professionals and managers, for example) work longer hours than formerly.
will be much more time available for leisure activities and life will center around these activities rather than around the task of making a living. Society will become leisure-oriented rather than work-oriented.4

This social reorientation almost certainly will present society with some very difficult problems which are going to have to be solved if we are to retain (or perhaps re-establish) a healthy, vigorous, social system. It already has been recognized that simply reducing the work week and giving the individual more free time does not necessarily make him better off, for his welfare is improved only if he enjoys having more free time. Many of the people who are in the position to obtain more free time simply are not able to use it constructively. They have not been trained to perform leisure activities.

Certain steps have been taken by a few industries and labor unions to try to provide workers with the skills necessary to produce leisure at the same time as they are being given the extra time to allow such activities. It would seem wise, however, to expect that all industries and unions will behave in such a manner, and even if they did it is not clear that they could be expected to do enough. Although it may be true that a worker performs better on the job if he is able to fill his free time with some kind of satisfying activity, it seems likely that if an employer provides a training in these activities just up to the point where marginal cost is equal to marginal benefit, the level of this training is likely to be too low from a social point of view. As we shall argue later, there are probably substantial externalities involved in the production of leisure.

Neither does the problem of the inability to use free time constructively apply only to the case of a reduced work week. At least as important a source of extra free time is the reduction of the retirement age. Early retirements result in workers having many potentially active and enjoyable years of life left after retirement age has been reached. As the problem is presently being made in medical research it is quite possible that in the near future retiring persons may have a life expectancy of ten or fifteen years.5 It is unlikely that employers will be much concerned with the way in which former employees spend their retirement years, and thus unless labor unions are able to bargain for benefits which will enable workers to make better use of the free time available on retirement, the problems associated with this kind of free time must be solved by either the individual or society.

This paper is an examination of the implications which the availability of more free time has for society. In particular we shall be concerned with whether the individual will be able to use this extra time in a way which is beneficial both to himself and to the society in which he lives, and with the problems which may arise if he cannot.

5Kemp (1960, 30) points out that in the 20th century the worker has gained an additional 9 hours free from labor. Wolfbleit (1958, 175) estimates that while in 1900 a 20 year old man had a life expectancy of 42.2 years and could expect 3.8 years of retirement, in 2000 a 30 year old man will expect to live 33.6 more years and have 8.7 years of retirement. This suggests a more than tripling of the average number of retirement years between 1900 and 2000.

The Model

Our approach follows that of Becker (1963) in that we consider leisure to be a commodity which is produced by the household or the individual6 and which possesses a production function having clearly distinguishable inputs. But while Becker's approach was to distinguish a wide variety of leisure goods or activities, and to consider these as being basically the same as any other commodity, in that both have inputs of time and market commodities, our approach is to consider the production of one aggregate commodity which we call leisure. While Becker was concerned with the allocation of time among these different kinds of goods and the economic consequences of relative price and income changes, our main concern is with whether the time available to an individual after he has put in the required number of hours eating, sleeping and working will be converted into a commodity which can legitimately be called leisure. While Becker tends to view the individual as making a decision about how much time he will work and how much time he will spend on non-work activities, our initial approach is to suppose that the amount of time that an individual works is given by the institutional arrangements of society. This assumption is relaxed in Section VI.

The main theme of this paper is that it is important to understand the questions concerning the time available for leisure is whether this available time, in fact, will be converted into leisure.7

The question of whether the relevant economic unit should be the individual or the family, while certainly of interest, is not relevant to our main discussion and is therefore not taken up here. For a comment on this point see Mincer (1960, 21).

We will use the expression "available time" to refer to the amount of time an individual has left after he has spent the required number of hours working, eating, sleeping, and carrying on any other necessary activities. This is what Milsen (1961, 21) has called "disposable personal time". Excluding such things as

eating and sleeping from leisure may seem a bit arbitrary, for one could argue that eating or dancing is a form of leisure, and many people seem to enjoy sleeping an hour or two longer on their days off. Similarly, the distinction between work and leisure is often blurred. Many economics, for example, seem to spend their "leisure time" doing economics, and much of their time working contains an element of leisure. But the important point is that for the purposes of our analysis it makes no difference in which categories these activities are placed. For our purposes it is with time which is not constructively used for anything, and the breakdown between leisure and labor is of no great significance.

There has been a good deal of discussion on how leisure should be defined. Gross (1961, 2-3) for example, defines leisure as the absence of work, and equates leisure and free time. Mead (1950, 10) suggests that in the American culture leisure is regarded as the reward for work. Griswold (1962, 1-16) defines leisure as "... a state of being in which activity is performed for its own sake or as its own end." He stresses that leisure is a state of mind and that it is not synonymous with play which "... for adult is needed only to relieve work." For further discussions of the definitional problem see Voss (1967), Brightbill (1960, Ch. 1), and Greenberg (1958, 38).

Note that it is the activity itself which gives rise to the increase in utility. If an activity is undertaken because it is expected to give rise to future utility then such an activity should be considered as leisure. A person who grows vegetables so that he may later consume them is working, but for our purposes such a distinction is of no great importance since both activities are non-constructive uses of time.
But while a leisure activity should not be calculated to reduce the utility of others we do not insist that it be neutral with respect to other individuals, for many leisure activities may have incidental external effects. Furthermore, the collective undesirable consequences of an activity carried out by many individuals should not exclude an activity from leisure, for going to a ball game should be considered as a leisure activity even if the ball-park traffic does make someone late for work. Even if the individual is aware that his activity may result in some disutility for others we should not exclude it unless the activity is carried out simply because it causes disutility to others. We would not want to exclude golf as a leisure activity even though golfers' wives may from time to time feel neglected.

From our definition of leisure it follows that an individual may fail to convert his available time into leisure. He may be forced to undertake activities which he does not feel will increase his utility or he may carry out activities which are calculated to reduce the utility of others. We will refer to such activities as "antileisure." Antileisure can thus be defined as any conversion of available time into an activity which the individual feels will have negative marginal utility for himself, or which is undertaken because it has negative marginal utility for someone else, or both. Antileisure may be either active or passive. It may simply be idleness or it may, for example, take the more violent form of vandalism.

Having now defined what we mean by leisure we turn to the consideration of how leisure can be produced. For the leisure production function there would seem to be at least four distinguishable inputs; T, the amount of time available, E, the level of education, G, the quantity of private goods available, and G, the quantity of public goods available, where all of these variables are taken to be stocks. Thus we can write

\[ L = f(T, E, G, G) \]

where L is the quantity of leisure for the individual and is in units of time, i.e., hours per day.

The variable E is a broadly defined variable that includes any education or training of a general or specific nature which assists an individual in converting available time into leisure. Reading a book is a leisure activity which requires that a person know how to read, and many hobbies require at least a small amount of training. But there is another quite important dimension to this education variable. A person is unlikely to spend much time reading if he has never been taught to appreciate literature, and a person is unlikely to spend much time at the opera or at symphony concerts unless he has been taught to appreciate these kinds of entertainment. Our variable E includes all such kinds of training.

Private goods, G, are a rather obvious input to the leisure function, for most of our leisure activities require either money (to buy the ticket to the opera) or consumer goods of some kind. One cannot watch TV unless one has a television set (or has access to one), and one cannot grow a vegetable garden unless one has a plot of ground.

The variable G refers to the goods and services supplied to a community by some level of government. It includes parks and recreational facilities such as swimming pools and recreational centres. On the service side we would include clean streets and such things as proper zoning laws and laws on building standards, and even such things as police protection. Going for a walk can be a leisure activity only if there is a decent, reasonably attractive place to walk, and only if you have no particular reason to fear for your personal safety.

The variable T differs from the other three in that it is completely passive. It does not itself give rise to leisure but only allows leisure to be produced. It is, in other words, a constraint on the amount of leisure which can be enjoyed. For purposes of our analysis the important question is whether or not all of T can be used up and thus equation (1) can be rewritten in the form

\[ L = f(E, G, G) \]

where L is interpreted as the number of hours of leisure which could be produced given E, G, and G. L may be greater or less than T, and we are concerned with the case in which L < T, for this is the case in which all leisure can exist. In fact antileisure, A, can be defined as

\[ A = T - L \]

where L is defined only if L < T. We want to minimize A subject to the inequality constraint that \( T - L < 0 \). In general A can be made smaller either by increasing L or by decreasing T, but in the next three sections we will assume that only L is variable. In Section VI we will return to the case where the individual can choose the amount of time he works so that T is a variable as well.

Since we have defined leisure in terms of utility it is important that we understand the relationship between these two concepts. It is immediately clear that the underlying utility maximization problem will be very complex and probably insoluble, for we have already referred to a number of externalities of which we must take account in our analysis, and such externalities may well prevent the solution of the maximization problem. It would nevertheless seem useful to set out exactly what the problem is.

Utility, both positive and negative, is assumed to derive from the activities of the individual himself and from the activities of others. We will define activities giving rise to positive utility as \( r_i \) and those giving rise to negative utility as \( a_i \), and we will denote the activities of other individuals with an asterisk. Thus, the utility function for the individual for some time period (a day or a week, for example) can be written as

\[ U = U_1, U_2, \ldots, U_{n-1}, U_n, U_n^*, \ldots, U_{n-1}^*, a_1, \ldots, a_l, \ldots, a_{l^*} \]

where all activities are in time units. The \( r_i \)'s and the \( a_i \)'s of course are simply the components of L and A and we have \( \sum_i a_i = A \) and \( \sum_i r_i = L \). We are assuming that, for the individual, only one activity can be carried on at a time. In (A), \( A_i \) could be the activity of going to the beach, \( a_i \) could be the activity of going to the beach, \( a_i \) could be the activity of waiting three hours in your car for a thunderstorm to pass, and \( r_i \) could be associated with the
fact that while you were swimming someone let the air out of all the tires on your car.

The utility derived from each of the activities in (4) will depend on the level at which the activity is operated, and this in turn will depend on the availability of the factors used in producing the activity. For $E_i$, for example, a certain amount of skill in swimming ($S_i$) will be required, and some private resources, including, perhaps, transportation ($G_i$) will be required. In this model many of the constraints will be in the form of inequalities so that formally the maximization of $U$ will be a non-linear programming problem. The leisure function ($L$) is the aggregate function associated with the $S_i$, and of this aggregate function will be subject to the same kinds of difficulties associated with any aggregate production function.

For each individual the ultimate task is the maximization of $U$, but the difficulties associated with this problem are so obvious and numerous that they do not even require enumeration. In order to produce a problem with some hope of solution the traditional approach takes the form of assuming away all variables but the $U_i$.'s. Our approach can be viewed as an attempt to take account of the $U_i$'s and at least some of the $S_i$'s, as well as the $G_i$'s. In terms of our previous example we want to reduce the boredom associated with waiting for the rain to end by providing a means of converting this time into leisure, perhaps by providing the individual with a good book (an element of $G_i$) and the ability to read it for pleasure (an element in $E$). We attempt to minimize $S_i$ by providing the individual associated with that activity with, for example, sufficient skill in swimming so that he will use his time to swim rather than to let the air out of car tires. An implicit assumption of our model is that given a choice an individual will prefer to increase his own utility rather than reduce that of someone else.

We are assuming, in other words, that the activities are "pure bads", resulting either in disutility to the individual in whose utility function they appear, or in disutility to someone else (or both), and thus the elimination of such activities will be a Pareto superior move. And because we reduce the $S_i$ by increasing the $G_i$'s, there is a further gain in utility. We are not suggesting, of course, that the minimization of $A$ will divide this gain equally in all areas, but we do stay that for that maximization has still to be carried out. The individual must still choose among the activities open to him in such a manner as to maximize the quality of leisure.

While the elimination of the $S_i$'s in one individual's utility function will eliminate some of the $G_i$'s for other individuals, there will be many $G_i$'s with which our model cannot deal. The $G_i$'s result from both the $E_i$ activities and $S_i$ activities of other individuals, for there are many quite legitimate utility maximizing activities of one individual that will reduce the utility of someone else. Our inability (or at least reluctance) to make interindividual utility comparisons precludes the consideration of such activities.

The Characteristics of the Leisure Function

It first of all seems fairly clear that $f$ is an increasing (or at least not decreasing) function of all three of its arguments so that we have $\frac{df}{de} > 0$, $\frac{df}{dg_1} > 0$, and $\frac{df}{dg_2} > 0$. The shapes of these partial derivative functions are likely to be quite different however. For example, with $E$ and $G_i$ constant, $L$ is likely to increase quite rapidly for initial increase in $G_i$, but we might expect the rate of increase to slow down fairly quickly. With a given level of education and public goods, certain basic recreational private goods, such as radios and television sets, will allow a quite a good deal of time to be converted into leisure. However the marginal leisure from watching television fairly quickly approaches zero. Further increases in leisure can be achieved by the purchase of additional recreational goods, but it becomes increasingly more costly to do so. Thus we are suggesting that $\frac{df}{dg_1} > 0$.

The second partial with respect to $E_i$, on the other hand, might be expected to be positive. At low educational levels increases in education will have only a small effect on $f$, for the difference between a grade two education and a grade nine education is probably relatively small with respect to the individual's ability to produce leisure. The difference between a grade nine education and a university degree presumably will be much greater, and as formal education increases, the ability to produce leisure increases more and more rapidly. A "learned man" may well be able to convert any amount of time into leisure even if the inputs of $G_i$ and $G_2$ are low. Of course this characteristic of the education system is by no means necessary; it results from the fact that education is work-oriented rather than leisure-oriented, and this orientation is particularly marked in the beginning years. One further observation is that for some of the less formal kinds of education, such as arts and crafts and other hobbies, benefits will be achieved much more quickly than in the formal education case. However it still seems reasonable to assume that at least up to a point returns will be increasing. We thus conclude that $\frac{df}{de} > 0$.

For $G_i$, the sign of the second partial derivative depends on what type and in what variety public goods and services are made available. While there are certainly decreasing returns to the provision of park services, if rather than just providing more parks the governmental authorities provide swimming pools, recreational facilities and such things as free excursions to nearby lakes, it is not clear that this function need necessarily have decreasing returns. For the moment let us assume that returns are constant so that $\frac{df}{dg_2} = 0$. As we shall see presently, this assumption is not crucial, for the important thing is whether returns decrease more quickly for private or for public goods.

In the function $f$ it is clear that $E_i$, $G_1$, and $G_2$ are independent. For example, the most important determinant of $G_1$ is income, and education is certainly an important determinant of income. Similarly, the level of education, will depend on $G_1$ since it includes such things as schools. Because these functional relationships will be important for the subsequent discussion it seems worthwhile to express $E_i$, $G_1$, and $G_2$ as explicit functions of what we consider to be their most important determinants. Thus we have:

$$G_1 = g_1(Y)$$

$$E = e(G_1, S_i, B_i)$$

$$G_2 = g_2(Y)$$

$$Y = Y(B_2, E, W_i)$$

where $Y$ is income per period, $B_2$ is ability, $W_i$ is the stock of wealth, which includes all income earning assets, $S_i$ is social position and reflects the education and income
of the individual's parents for the period when the individual was a student, and where G7 is the level of governmental goods and services assumed to be exogenous and determined by government policy. The "Y" subscript also signifies that a variable is exogenous but further indicates that the variable can either not be changed (as R3) or that it is not usually considered to be a policy variable. Note that all the first partial derivatives of the equations (5), (6), and (8) can be considered to be positive.

One of the troublesome characteristics of equation (2) relates to the units of measurement of the three inputs. Besides the usual aggregation problems, for G7 the situation is complicated by the fact that governments, expenditure on recreational, or leisure, goods is an aggregate quantity while the leisure function relates to the individual. However, because of the public goods quality of these goods it would seem appropriate to allocate the total government provision of such goods to every individual who could make use of the facilities.

The Forms of Antileisure

The main contention of this paper is that antileisure should be minimized, and it would seem appropriate to outline just why antileisure is an undesirable common good, and what partial forms it may take. Put in its simplest form, our hypothesis is that for at least some individuals an increase in the amount of time that they are not required to spend working and carrying out other basic activities may decrease their total utility. Is there any evidence to support this view? Judging from the views of some individuals close to organized labour, there is, for we have such statements as "The burden of leisure, being the exclusive curse of the rich, is now the darkest threat to the well-being of the working man and the subject of increasing concern on the part of organized labour." Wakefield (1966, 177). Wakefield also refers to a Gallup poll which showed that only 29 percent of the population as a whole and only 42 percent of union people were in favor of reducing the work week from 40 to 35 hours. The fact that many people "moonlight", even though it is much discouraged by the unions, also suggests that some workers want more work, not less. Perlman (1966, 242) reports that 5.2 percent of all workers in the United States hold at least two jobs. There is some evidence to suggest, then, that at least some workers are not clamouring for more and not of leisure.

This growing concern with extra available time seems certainly to result from the fact that much of this time is being converted not into leisure but into antileisure. The extra available time results not in increased well-being but in boredom. And not only does boredom directly reduce an individual's welfare, there is increasing evidence to suggest that a person's mental and even physical health are dependent on whether the individual "can keep busy" at either work or leisure. Drug addiction, alcoholism, and suicides may be related to the boredom associated with the inability of individuals to keep busy or to use leisure.

This antileisure may also have further undesirable consequences. People who find themselves with "nothing to do" may not be content to do nothing but may turn their energies to activities which, while providing excitement and therefore utility for themselves, may result in a redaction in utility for other members of society. One of the ways in which such "excitement" can be obtained which often involves almost no input other than time, is the performance of acts which are illegal. Here the excitement and utility derive simply from the "game" of avoiding apprehension—a sort of sophisticated hide and seek. Much of juvenile delinquency seems to fall into this class. Groups of teenagers perform acts of vandalism which certainly yield no material rewards, and steal automobiles for no apparent reason. Many of the shoplifters who are caught are found to have sufficient money to have purchased the article stolen and thus are clearly not stealing out of need. And note that shoplifting is becoming an increasingly important social problem. It is also relevant to note that there have been many numbers of factors tending to increase the amount of time available to teenagers. Such things as the population shift from farms to urban centres and within the urban centres the shift away from family businesses has resulted in a higher "unemployment rate" for younger members of the family. It also seems possible that the hippie movement and its variants, and the increase in the use of drugs may be the result of the production of antileisure.

For comments on the relationship between available time and juvenile delinquency see Lynn (1958, 34) and Milestone (1961, 255).

For evidence of the importance of parents' income and education on the academic achievement of the child see Concel (1969) and Maren (1969).

This ignores the problem of congestion, but this can be taken into account by shifting the function.

One can speculate that antileisure is showing up in many other areas in society as well. We might ask, for example, whether the build-up in racial tension that has occurred in the last decade is independent of the increase in the amount of spare time that has become available to the antagonists. If an individual spends most of his waking hours at work he does not have much time to worry about social injustice. And the migration of poor blacks from the rural areas to the urban areas has accentuated this problem, for rather than working long hours in the fields the city worker now has much shorter hours in the factory. This, of course, is only one of many reasons why the racial unrest has occurred largely in urban and not rural areas.

An extreme manifestation of this racial tension has been the riots which have occurred in many of the major cities in the United States in the last few years. These, for the most part, have taken place in poor, overcrowded, areas and generally during very hot summer weather. All these factors tend to make the production of leisure time difficult. Insofar as the racial tension and the resulting violence can be characterized as antileisure, there would seem to be some important policy implications. The first, and obvious one, is that in order to ensure a long-run solution, the basic causes must be removed, which means that the level of education must be improved, income must be raised so that more people would have leisure time.
private goods can be purchased, and more public facilities must be provided. There is, however, an implication for the various social security systems that may not be as obvious. For example, the present system of unemployment benefits provides unemployed workers with a small amount of income and a very large amount of available time which practically guarantees the production of a large amount of anteility.

The ghetto areas are characterized by high levels of unemployment, and thus the present system of unemployment benefits (and other forms of welfare) may well be a contributing factor to the recent unrest which has occurred in these areas. Some people might further and suggest that present welfare plans actually discourage people from working, and insofar as this is the case the situation is made even worse. While there is no simple answer to this problem, it seems clear that much more emphasis should be placed on finding work for the unemployed and making sure that they have the appropriate skills for the available jobs. One step in this direction would be to make unemployment benefits and other welfare payments conditional on the attendance of retraining schools for those who are able to be trained and who do not, at present, have sufficient skill to get a job. It also seems likely that plans such as the negative income tax would be helpful in reducing the production of anteility.

Before going on to a discussion of some additional policy implications which would seem to follow from this discussion, it should be made clear that we are not trying to suggest that all the evils of the world can be attributed to the spectre of anteility. We are only suggesting that the inability of individuals to convert available time into leisure may be one of the factors that have given rise to the recent advent of some of the above-mentioned phenomena as important social problems. Casual observation suggests a correlation between the increase in available time and the increase in the seriousness of these problems, but of course this relation may be entirely spurious, and some kind of empirical test must be devised to test these hypotheses before any firm conclusions can be reached. It is also admitted that such tests will probably be very difficult to devise.

**Policy Implications**

In this section we will take as given the proposition that the production of anteility should be minimized, and we will continue to assume that the amount of available time is given institutionally. Consideration of the three inputs of the leisure function suggests that $E$, being basically a long run phenomenon, be considered as a policy parameter affecting the long run solution, while $G_1$ and $G_2$ arc much more easily changed and can thus be used to bring about short term adjustments. We will consider the short term adjustments first.

Under the assumption that in the short run, education is given, the short run counterpart of (3) can be written

$$L_e = f(G_1, G_2).$$  (9)

There are two kinds of questions which we can ask about this short run function. First, for any level of total expenditure what are the appropriate combinations of $G_1$ and $G_2$, and second, if $L_e$ is to be increased, how can this best be accomplished? It is clear that for any given level of total expenditure, the expenditure should be allocated between $G_1$ and $G_2$ in such a way that the marginal leisure per dollar for each is equal. This can be illustrated by considering the isoleisure map of Figure 1, where an isoleisure line is defined to be the locus of the various combinations of $G_1$ and $G_2$ which would produce some fixed quantity of leisure. In this diagram $G_1$ measures private leisure goods in dollar terms, and $G_2$ measures the spending per individual on public leisure facilities. Thus if we were observed to be at point C where private spending on leisure goods is too high and public spending too low, we should attempt to move to $E$, perhaps by raising taxes and using the increased revenue to increase public leisure facilities. Note that while the line $AB$ represents a budget constraint, the individual is not, in general, free to choose his position on the line. This will be determined by government policy. Thus there will be no automatic mechanism to move us to $E.

Now suppose that initially we are at $E$ but that $L_e$ is not at a high enough level to eliminate anteility. In order to increase leisure we must shift our isocost line until a tangency with the appropriate isoleisure curve is achieved. We are concerned with how, in shifting out this isocost line, expenditure should be allocated between $G_1$ and $G_2$. We suggested earlier that $G_2$ would be expected to exhibit fairly sharply decreasing marginal productivity, while the marginal product of $G_1$ might be almost constant. This would suggest that in order to maximize the extra output of leisure for any given increment in expenditure, most of the expenditure should be allocated to $G_2$.

To consider a specific example, suppose the leisure function has the form

$$L_e = aG_2 + G_1^2$$  (10)

where $a > 0, 0 < b < 1$. It is clear that for this function the marginal product of $G_2$ is constant while the marginal product of $G_1$ is decreasing. But we also observe that the ratio of the marginal products is independent of $G_1$, which means that the slopes of the isoleisure curves depend only on $G_1$. In other words, all the isoleisure curves have the same slope along any vertical line. Thus for the higher expenditure line $A'B'$, the equilibrium point will shift up to $E'$, implying...
ing that all the new expenditure should be allocated to $G_2$ and none to $G_1$. Of course, the function given by (10) is very special, and we are only attempting to illustrate that if the rate of decrease of the marginal leisure curve for one input tends to be lower than for other inputs, then additional expenditure will have to be biased towards this good if equilibrium is to be achieved.

The single most important determinant of $G_1$ is disposable income (equation (5)) and thus the choice between $G_1$ and $G_2$ is essentially one of whether the government or the individual should spend the increment of income, and this depends on the shapes of the marginal leisure curves.

We turn now to a consideration of the long run. If, as we have suggested, the marginal product of education increases at an increasing rate, then it is possible that with enough education, deficiencies in $G_1$ and $G_2$ can be overcome. It could then be argued that more resources should be channeled into education not only to increase human capital so that productivity can rise, but also to better train people to convert available time into leisure. Another way to increase leisure through the education variable is by shifting the function itself by opting for a more leisure-oriented rather than work-oriented education system.

We must also be aware of the fact that even if the marginal product of education is increasing we cannot definitely conclude that even as a long run measure increases in education are the most appropriate means of eliminating antileisure. Even though the marginal product of education increases it may be bounded from above so that at least for some range of expenditures (and possibly for all) the marginal products of $G_1$ and $G_2$ could be higher than they are for $E$. It is theoretically possible that from the point of view of the production of leisure, all resources should be shifted out of $E$ into $G_1$ and $G_2$.

The arguments of this section can be represented geometrically in terms of leisure and work as follows. From equations (2) and (5) and keeping $G_1$ and $E$ constant we can write

$$ L = A(Y).$$

Furthermore, if we define $w$ as the wage rate, assumed to be fixed, and $N$ as the number of hours worked, then $Y = wN$ and we have

$$ L = h(N).$$

This function is shown in Figure 2. It will increase at a decreasing rate as long as $L$ increases at a decreasing rate for increases in $G_1$.\(^{20}\)

The vertical axis in Figure 2 represents the amount of time available to the individual. This time is either used for working or is available for leisure. For any given amount of work done the amount of time available for leisure can be found from the 45° line $AB$. Thus if the amount of work done is $N^*$, the amount of time available for leisure is $C$. The question with which we are concerned is whether the individual can convert this available time into leisure.

The situation where the amount of time spent at work is institutionally given can be represented in Figure 2 by supposing that the amount of time spent working is fixed at $N^*$. The amount of leisure that can be produced is $D$ and this falls short of the time available for leisure by $C-D$. Thus the leisure function $h(N)$ represents the amount of antileisure produced. To eliminate this antileisure $h(N)$ must be shifted up to $h(N^*)$ and this can be accomplished, as we suggested earlier, by increasing $G_1$ (through increasing $w$ and thus income), by increasing $G_2$ or by increasing $E$. Of course it is also possible that there could be excess capacity in the production of leisure. Suppose, for example, that with the leisure function $h(N)$ the work week is $N_1$. This would give the individual the capacity to produce the amount of leisure $E$, but due to the time constraint only $E$ is possible. In such a case the individual would reduce his utility by improving the quality of his leisure or by working less hours, or both.

The above analysis leads to the following interesting situation. Suppose we have two types of workers who are identical except that, due to a difference in technical skill, one group receives a higher wage than the other. Suppose the higher and lower wage groups have the leisure functions $h(N)$ and $h(N^*)$ respectively, and that the work week is fixed at $N$. Both groups of workers enjoy an amount of leisure, but the higher paid workers have excess leisure capacity. Now suppose these workers bargain for a reduced work week $N^*$ and that this "benefit", when obtained, applies to all workers. It is clear that only the higher paid workers have been better off, for the lower paid workers have had their leisure reduced to $N$. Thus if in the bargaining process the week work remains the same for everyone and if the higher paid workers have a stronger bargaining position, a contract beneficial to these workers may give rise to the production of a substantial amount of antileisure for the lower paid workers. And observe that as long as $h(N)$ and $h(N^*)$ differ, equilibrium for both groups can be achieved only by allowing different lengths of work weeks. The tradition of a standard work week may be imposing considerable hardship on the lower paid worker. It also seems reasonable to assume that union leaders, either because of higher incomes or more education, will have higher leisure functions, and this will bias labour union policy against the unskilled worker. It is also of interest to observe that if, when wages rise, hours of work are reduced so that take home pay remains the same, the same amount of leisure will be produced but more time will be available. Such a shift is thus beneficial to individuals with excess capacity in the production of leisure, but is harmful to workers with antileisure.

In this section, although we have been dealing with policy questions, we have been considering the individual and not society as a whole. If policy tools are seen as dealing with aggregates then we must address the question of whether the leisure functions for all individuals can be aggregated to obtain a leisure function for society. One set of sufficient conditions for such an aggregation is that all leisure functions be identical.
and homothetic, and it is clear that neither of these conditions could be expected to hold in our model. It should be observed, however, that there are two ways of dealing with this problem; one is to aggregate the leisure functions and the other is to disaggregate the policy. To take the extreme case, no problems arise if we regard the government as dealing with all individuals on an individual basis. While such extreme disaggregation is clearly impractical, on the assumption that the major difference between individuals is associated with income, policies disaggregated according to income levels might be expected to solve most of the aggregation problem.\textsuperscript{28} It must be admitted, however, that the "public good" nature of many of the government-supplied leisure goods will almost certainly result in excess leisure capacity for many individuals if we attempt to eliminate antileisure for the majority, and only a careful cost-benefit analysis would answer the question of how far any given policy should be pursued.

Available Time as a Variable

To this point we have assumed that the amount of available time that individuals have is institutionally given and beyond their control. In this section we will consider the case where individuals are allowed to determine exactly how much time they work.\textsuperscript{29} The question which then arises is whether, in such a model, antileisure will ever exist.\textsuperscript{30} Consider first the case where work is neutral in the sense that it is assumed to yield neither utility nor disutility. In Figure 2 the total leisure function for the case where \( L = h(N) \) is \( OGB \). Leisure is maximized by working \( N_t \) hours and at this point no antileisure exists.

But now consider the somewhat more realistic case where work yields disutility. The individual will now maximize his utility by working up to the point where the dis-satisfaction from working the last hour is just equal to the benefit that this last hour of work yields, that is, up to the point where marginal utility is equal to marginal disutility. It is clear that to consider such a case we must construct the utility function from the leisure function of Figure 2. We will begin by constructing the total utility curve associated with Figure 2, and then construct the marginal utility curve which can then be compared with the marginal disutility from working.

The total utility for the individual of Figure 2 is made up of two parts; the utility associated with the curve \( h(N) \), and the disutility associated with the production of antileisure up to point \( N_t \). Considering the utility portion first, with the wage rate assumed fixed, the utility associated with increases in \( N \) is the same as the utility associated with increases in \( Y \) so that we want \( U = U(Y) \). Although there can be no definite answer as to what this curve will look like, a common assumption used in microeconomics is that the marginal utility of income is a constant, which implies that, up until \( N = N_t \), \( U \) will be linear as in Figure 3. At \( N = N_t \), the time constraint becomes effective so that marginal utility will begin to fall, and utility will become zero at \( N = B \) from Figure 2. Note that utility may well continue to rise after \( N = N_t \), for although after this point the time available for leisure begins to fall, the increase in income associated with increases in \( N \) may allow the quality of leisure to increase and thus increase utility.

The disutility from antileisure is associated with the distance between \( AB \) and \( h(N) \) in Figure 2. It seems reasonable to assume that the longer the hours spent on antileisure the larger will the marginal disutility become, and this gives a disutility curve such as \( M_N \) of Figure 3. Total utility is now the sum of these two curves and is \( MAB \) in Figure 3. Associated with this total utility curve we have the marginal utility curve \( GHJK \) in Figure 4. Note that in general the marginal utility curve will have a discontinuous segment at \( N = N_t \). We now consider the marginal disutility of work, and will assume it is the curve \( DD \) in Figure 4. If \( DD \) intersects the discontinuous portion of the marginal utility curve or anywhere to the right of \( N_t \) then antileisure will be zero. If, however, the marginal disutility curve intersects the GH portion, as does \( DD' \), for example, then hours of work will be \( N_t \) which, from Figure 2, indicates the existence of antileisure for that individual, even though he is assumed to be perfectly free to choose the number of hours he works. This antileisure could be eliminated either by making work more desirable and shifting \( D'D' \) down or by shifting \( h(N) \) in Figure 2 up to \( K(N) \), say, so that the discontinuity of the \( MU \) function would occur at \( N_t \).

Summary and Conclusions

In this paper we have argued that we must carefully distinguish between leisure and available time. Available time is necessary for leisure, but it is not sufficient, and to produce leisure other inputs are needed as well. Other inputs to the leisure function include private goods, public goods, and education, and if these do not exist in large enough quantities a person may not be able to produce enough leisure to fill his available time, and the residual is called antileisure. It is argued that this antileisure may be related to some of the social problems which currently face society.

\textsuperscript{28} Note that if work is particularly desirable \( DD \) could intersect the \( MU \) axis above \( O \), in which case utility maximization would lead the individual to not work at all. And if work yields utility then the intersection will be below the \( N \) axis.
Insofar as antileisure is undesirable, then we must attempt to minimize the quantity that is produced. How this can best be done depends on the specific form of the leisure function. We have hypothesized that returns to education are increasing, returns to private goods decreasing, while returns to public goods may be almost constant. This being the case it is suggested that the long run solution may come through education. In the short run the choice will be between public and private goods, and if returns to public goods decrease less quickly than returns to private goods, then more resources should be channeled into this kind of expenditure. Thus as national income increases a higher and higher proportion of expenditure should be allocated to providing public leisure facilities.

It is also shown that if workers' wages differ, then the imposition of a standard work week will result in excess capacity for leisure production for some, antileisure for some, or both. The situation could be improved by allowing the work week to vary inversely with the wage rate. However, allowing people to exactly specify their work week will necessarily result in zero antileisure only if work has no disutility.

References