ASPECTS OF TIME
AND THE
STUDY OF ACTIVITY ROUTINES

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This study emphasises the importance of understanding urban activities. Planning—especially in its physical concerns—has, typically, attended to land uses, structures and certain occupancy characteristics while neglecting the dynamics of environmental use and behavior in terms of social interaction and activity.

It isolates itself from areas that are particularly sensitive in respect of social needs and well being; and is castigated for misunderstanding or misconstruing the urban condition. It finds difficulty in communing with disciplines such as sociology, social psychology and social planning because its theoretical notions and operational methodology is restrictive in these areas.

Attempt is made here to marry physical situations to their social milieu of interaction and process through both conceptual scheme and operational measuring techniques that accommodate some of the disparate issues of physical and social concern.

It is suggested that activities be conceptually and operationally defined in terms of temporal notions and measures which emphasise their dynamic flow qualities. Thus, for example, the extent of individual and class Time Horizons is given as indicator of the general scope of pertinent activities. And the acting out of activities within that scope, on a diurnal, monthly and yearly basis, is given a Time Budget measure designed to record Inputs (actor contributions) and Outputs (satisfactions) of activities.

A Test Case, focusing on the Time Budget as operational measure of overt activity, is presented.

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INTRODUCTION

Attention in the formulation of this study was given first to Time and subsequently to Activity. This is important, because the order of attention influenced the exploratory questions which were raised.

Thus research progressed as enquiry into what is time, how does it constrain us, how do we use it as framework and as measure of our actions, how applicable is it to the explanation and measurement of activities or, indeed, of other aspects of planning? This is specifically different (as will be further emphasised and explained) from a study of activities, the realization of their temporal component, and an investigation of its potentiality in their study. We are interested in the possibility that time as a comprehensive formulation may explain certain aspects of activity.

This interest points to the fact that immediate concern was not given to a particular planning problem or task, but to an existential phenomenon of implication (possibly but probably) for planning. In the same way, Space, might, as concept or object or both, be evaluated for planning implications in respect of use and form; so far, it has not--by custom and agreement we presume a mutuality, congruence and synonymity between space and certain aspects of planning to which it is commonly married. Thus, we should; (1) consider time (or space) as a phenomenon with its own inherent and
individual characteristics—duration and sequence are examples; (2) consider all aspects of activity (or form and use) which are potentially relevant to planning—this would be a special and particularised list which, as we shall see, can readily embrace aspects beyond those that are notionally relevant to the disciplines of sociology (e.g., participation, communication) and social psychology etc., (3) ask, in operational terms, how satisfactorily the aspects of time will measure and reflect those of activity (or form) which we have specified to be relevant.

Patently we will expect a certain natural congruity—we have empirical knowledge (as guarantee) and the results of prior study as suggestion. But, (to repeat), we must nevertheless examine our commonly held associations in some depth, at both conceptual and operational level to judge the extent of their validity.

To evaluate implications of time for the activity component of planning necessitates criteria, designed to reflect the particular cost of our planning concerns. One criterion will generally be sufficient to our purpose, for it explicitly directs all others that follow; it is that the utility of time in explaining the nature and variability of activities will exist only in as much as the explanation is of use in a practical planning situation, to a major, expert and well-financed, planning office. This is, to be sure, a stiff criterion for a first study, but it will be interpreted
loosely as a general guide rather than as an overrealistic constraint. If time could explain little save, for example, the micro-sociology of interaction taking place in an activity, its application and lesson might certainly enhance the sophistication of the planning staff but we would not deem it a comprehensive measure providing insight or data amenable to policy, design, and control procedures.

Of the two components, activity and time, activity is the more intuitively comfortable. It implies common notions, common things, and understood realities. Time, by comparison, is either abstract in concept or dominantly concrete, a manageable continuum of seconds and minutes; it may be useful to offer some ideas and notions of time with a view to diminishing, somewhat, the hiatus between these two levels of conceptualisation. To this the remainder of the introduction is devoted. (Such devotion should not imply that the commonly imagined comprehension of Activity is valid and requires no clarification. We have emphasised that this is not the case, but the common comprehension is probably sufficient to be carried until later in the study as a satisfactory understanding.)

Time. Man lives amidst change; even before he becomes aware of the fact that he himself is changing, he sees continuous changes in the surrounding world. The birth of the notion of Time is no doubt the result of the experience of
successions of which some are periodic and others not, of continuous and discontinuous changes, or renewals and of relatively permanent states. In his effort to master the fundamental conditions of existence it is not surprising that man should use these occurrences as natural frames of reference against which to locate other changes, and as a means of measurement.

But consider further the apparent simplicity of this Time notion and of the synthesis it implies in the utilisation of observed phenomena. Where and why do we get the ability for such conceptual summary and how is it related to our immediate experience? Historically this has been a question of epistemology which has, in turn, led to more specifically psychological questions,¹ (that come close to our concerns). In recount this history will be brief with but sketchy reference to the main themes of its content.

All philosophers have agreed that time does not exist without changes. But what changes, in our sensations (of the seasons for example) or in our thoughts. Much attention and argument has been devoted to the explanation of one or the other approach, leading, contemporily, to the agreed conclusion (which in resolution seems clear) that the idea of time is born in the life of thought. It was in moulding this conclusion that Kant showed the notion of time to be a
way of considering events, not a copy of them; we might add to this that the way of considering a situation is likely to condition future responses to it. Our conceptual summary of time is, then, of supra-sensational origin. It is the temporality of the conscious, revealed by our only experience, that of the present; the present does not exist without its horizons, for it is the present of a being in a perpetual state of change. Consciousness reveals time which thus seems like a dimension of our being.\(^2\)

It was Kant also who prepared the way for the psychologists by diverting them from the search for a reality in itself (as a result of his demonstration that the origin of time notions is in the activity of the mind).\(^3\) By making time a form of sensitivity he reshaped the whole problem; after him philosophers and psychologists were less concerned with the notion of time than with our awareness and use of it. To explain developments in the post-Kantian period we should turn to the discipline of psychology.

The first quarter of the twentieth century saw the whole of psychology turned into a science of human behavior, and by the 1920's the attitude of this new psychology to time had been formulated in the work of Pieron and Paget.\(^4\) It stressed that psychology has better things to do than to concentrate on the study of thought (Kant's suggestions were inspirational), and that it must start out from action. "The only question" asserted Paget, "was what action do we have on time." And in answer he (and others) concluded that
the first action relating to time is behavior of effort which, like expectant behavior, gives rise to feelings of duration. (We shall later characterise, somewhat crudely, this behavior mode as one aimed at the formulation of a time horizon which sets the limits of an individual's future and his expectations as efficacious actor. In a sense the actor must know who he is (in time) before selecting time expenditures for specific acts which fit to and confirm that knowledge—in the young a time horizon is so short that the immediate time expenditure or action is often the limit of their extent and, in a sense, the present is the future.) This feeling is not a primary action (or activity) but a regulation of action due to the necessity of our adapting to irreversible changes, (the continuity of life which is at the root of time notions).

Our notion of time (however primitive) is, therefore, a mental construction of fundamental importance in orientation and functioning; having constructed the notion of periodicities our first related action is a behavior of effort designed to allot durations in the structure of time as a schematic regulation of future time expenditures. This is central to our future discussion; man makes regulations of duration as a hold on the changes which his time notion has pronounced, and he makes these before and independent of primary actions or activities.
In fine, the problem is no longer to know either what time is or what is the nature of one's notion of time, nor is it even to seek the genesis of time in some intuition or construction of the mind; it is to understand how man reacts to the situation imposed on him of living in time. Far from being misconstrued, the data supplied to our conscious mind find their true significance in this situation. "They are not a mere copy of reality but a collection of signs, formulae and useful interpretations which develop in action itself, and serve in return as a guide (not an explanation) for our activity as we become conscious of them." Patently, this present-day formulation of the problem sees time not as a variable to be explained but as an explanatory variable; this accent makes it amenable to our purpose, which aims at the practical usefulness of aspects of time.

City Planning save for certain of its specialised urban design functions is not a visual art. The city is not a work of visual art. Its mental images evolve only as a sequence of perceptions in space and in time. In this respect it is akin not only to the products of the Spatial arts, but also of the temporal arts, "to works of music or literature." Activities are the ingredients of the temporal matrix; this is why they become the focus of this study. They tell the story of how the city lives rather than of what it is, of how it is used rather than of what it contains. They
describe the dynamism of change by the minute, the hour and the day, in a way much different from the more gradual (by comparison) development of the Spatial dimension.

It is to the further explication and examination of the correctness of such summary statements (or convictions) that the remainder of this study is devoted.
SECTION 1:
ASPECTS OF TIME
SECTION 1. Aspects of Time

In this section, six aspects of time are examined. The first three aspects—Time Budgets, Social Time and Psychological Time—are designed to explain the notion and (typical) method of measurement of time periodicities either 1) in the way in which we allot expenditures of time in some periodic, though not necessarily repetitive, diurnal or monthly or yearly cycle, or 2) in the way the calendrical flow of time can be divided or described in a manner which often disregards or unequalises chronological periodicities—this is the realm of social and psychological time. These distinctions will be clearer upon further explanation; at this point it is important to appreciate that emphasis will be upon the cyclical duration and sequence of time and ways in which they can be described, either calendrically, socially, or psychologically.

Aspect 4, Time Horizon, has been mentioned in the Introduction. It is concerned, primarily, with the duration of an individual's perceived future of expectations and reasonable actions. It is, then, a global all-embracing time constraint within which and toward the fulfillment of which the individual engages upon time expenditures, each of duration and sequence.

Aspects 5 and 6 introduce terminology to be used in further Sections of the study, and some conceptual notions as to how time can be useful as description and causal link in statements about urban process, change and growth.
Clearly the choice of these aspects is such as to preclude an interest in much of the fascinating research into time—we have, for example, already rejected most of the philosophy of time, and we will not review the well-developed study of cross-cultural differences in time use and perception. Here is the first exercise of our criterion of 'physical planning relevance.'

(1) **Chronological Time and Time Budgets:** (the historical review of time budgets in Appendix 1, shows that) the time-budget concept is closely allied to (and derives from) studies of household budgets of income and expenditure—both are records (often sequential, or at least ordered) of the flow and priorities of a resource expenditure. It is interesting to note how well the time and money terms fit into the series of modern colloquialisms: time can be saved, it can be spent, or wasted.\(^1\) It is very much like money, for some time is money. Today in urban life, time because of its value, is managed; it is understandable that attempts have been made to set up budgets (or, more properly, accounts) of time management by individuals and groups or by firms and other entities in the urban scene.

One important omission of the money-time analogy is that a housekeeping or money expenditure record of a household or individual (or firm) need not encompass all human concerns, even all economically relevant concerns. Expenditure of money except in a few cases is not a fully reliable measurement of the range of involvement; time, in contrast,
is, in its chronological sense, a container of all that is undertaken. (This is not, as we shall see, to say that a record of the chronological use of the time resource will provide all relevant information about the conditions and aspects of the activity therein.)

Time-budgets are generally constructed from the reported data of individuals (or firms or organisations) concerning the way in which they have used time in pursuit of a range of classified purposes. Depending on methods of research (measurement, aggregation, analysis etc.), interest and purpose, the reporting may consider intervals as little as five minutes or as great as 24 hours or a week or month. The data can be constructed so as to,

a) point to the nature and duration of expenditures,

b) provide a picture of the social structure which surrounds the respondents, by asking questions illuminating the situational properties of each expenditure,

c) be related to the spatial setting which binds both the expenditure of time and associated structures (social, economic etc.).

In fine, the procedure of time-budget analysis can answer the following questions.

Where (did you spend your time),

When (in day, week etc.),

What (did you do--a general classification of activity types perhaps),
With whom, For how long, How much, These factors can, on occasion, be interpreted as intensity. We shall note (page 26) instances where such a summary is inapplicable.

Time-budget data does not answer 'Why' questions about time allocation and expenditure. It is directly quantifiable.

However, the analysis of the data can elicit certain laws or rules in respect to conditions concomitant to various modes of time expenditure. Thus Sorokin observes that for some expenditures, "the longer the time consumed...per participant, the less the percent of participation (number of participants) in it tends to be," and that "there is an inverse relation between the amount of time spent on an act and the number of times it occurs daily"³ (apart from the obvious condition of, for example, an eight hour expenditure). Or, with but little extra informational input, a more refined and operational rule can be divined--thus Simon offers a prediction "that might be described as the 'Gresham's Law' of planning. That is, daily routine drives out planning." Stated less cryptically, we predict that when an individual is faced "both with highly programmed and highly unprogrammed tasks" (information about program is not directly included in time-budgets), "the former take precedence over the latter even in the absence of strong overall time pressure."⁴ We shall refer to these
types of interpretation and analysis as Configuration (interpretation similar to that of Sorokin) and Sequential Rules (Simon).

Time-budget data can, on occasion, be replaced or, better, supplemented by the analysis of records such as school attendance lists, library returns, entertainment attendance records and other unobtrusive measures. The nature of the study obviously influences the usefulness of each technique, but it would seem that an analysis from records generally eliminates detail information (about individuals for example) whereas the survey technique can focus on a particular group, a particular time of day or a particular aspect of behavior.

In fine, "time (along with space) is a universal container of human phenomena." It is, furthermore, capable of measurements "along a single dimension." Thus, because everybody has to be somewhere (or has to be doing something).....a single number representing time expenditure has the potential of placing a particular segment of human behavior in a useful perspective. We conclude that empirical information about the way people spend time can be an indispensable guide to the understanding of daily social life. Carried one step further, time-budget data can usefully compare and emphasise the most significant differences in social life occurring over a chosen time-period, as well as reflecting the actual day-to day effects of technological or of behavioral change.
(2) **Social Time**: chronological or container time, time as a resource, is but one aspect of the phenomenon. Time may have social meaning independent of its resource attributes in their relationship to chronological events. October, 1929 becomes, for example, socially important as the month of the Wall Street crash; it has significance for, and gathers the sentiments of, many people in a way that no other such point in time can replicate. History or future plan can thus mark temporal points with a significance unrevealed by chronological time and its measurement, except in that any such point corresponds to untypical perturbations or noise in the ongoing record of the process of time expenditure (measured by a time-budget technique). A point so marked may be the culmination of an earlier process, a single random event, or the inauguration of a process; each point and related process acquires a social meaning that becomes dynamic in its own right.

Related to social meaning is the concept of time **social sequence** which may, for example, indicate priority of events (work before play) in the sense of scheduling while at the same time expressing a social (or moral or cultural) preference and distinction. The fact that "Negroes habitually eat after whites" is chronologically a temporal segregation; the implications of social process and meaning, however, go beyond such straightforward sequence and relate time to social variables.
In caution, we shall encounter three uses of sequence, two have been mentioned. The first is the management of time explained by the budget expenditures, the sequence (loosely interpreted to include priorities) of allocation which can, by interpretation, be useful in suggesting configuration and in revealing sequential rules. Social sequence (the second use) requires (or adds) additional information to the time-skeleton of process. Firey, in his recognition of sentiment and symbolism as influential variables in economic decisions (money expenditures) implicating land use in Boston, points, analogously, to the curious sequence and apparently unpredictable nature of expenditure measured and analysed only as resource independent of social meaning and sequence.

In respect to the suggestion of measuring social change by the time series or longitudinal comparison of time-budgets, we should observe that perhaps periods of years, months, weeks, or days, are not the only and possibly not the most readily applicable temporal measures in a system of social dynamics. This, as suggested, is because the methods we adopt for assigning a time to events changes when the character of the events changes. Equal periods of resource time may be rendered socially unequal and unequal periods may be socially equalised: the search for social periodicities may be difficult in terms of calendrical or chronological periodicities alone, but may be found quite periodic
eight-hour work day. But these variations may be explained only by the recognition that the social life of a group is expressed in its time expenditures (and, as we saw, in its expressions about them). As Horton writes in his investigation of Colored People's Time, "negro street time is built around the irrelevance of clock time, white man's time, and the relevance of street values and activities. Like any one else the dude is on time whenever he wants to be, not on time when he does not want to be and does not have to be."7*

(3) Psychological Time: evidently, comments on social time and the adequacy of a chronological measure are largely relevant to the psychological realm. We can repeat the same cautions, we can note that time can have psychological meaning—activities which are perceived as pleasurable appear to pass quickly in time,—or psychological sequence—the saying "many a slip twixt cup and lip" can be borne in mind so as to extend the shortest of temporal sequences into a perceptual period more easily

* There are many other characteristics of social time to which we might draw attention. The way we express the change of social phenomena in terms of other social phenomena taken as points of reference—"all that has changed since Kennedy was killed": or the references we make to generally comprehensible time durations without any mention of chronological or astronomical phenomena,—"for a semester," "for the duration of lent"—often without even a fixed relationship between these durations and astronomical phenomena, since the social intervals may vary independently; all these are interesting mannerisms and techniques. Yet we must maintain, (and have tried to illustrate), social time which will condition or reflect behavior in time in fundamental ways that are of interest to planning.
recalled than the processes of 'filling the cup.' We can also observe; (a) that psychological periodicities may unequalise temporal ones--as was seen to be true of social periodicities--so that in an analysis of change the dimensional contortions or functional elaborations of largely qualitative psychological processes, as they effect quantitative time data, must be observed; (b) the personal individuality of psychological time formulations may make for difficulties in the generalisation of meaning and sequence phenomena to larger psychological or sociological units of reference; (c) the use of psychological time is an important consideration.

(4) Life Pattern Time (or Cultural Time): Summarising and adding to the above temporal aspects is the condition of time perspective or time horizon. Banfield explains that in most behavioral and social science the individual is thought of as having goals (images of future states of affairs toward the realisation of which action is directed) or as being able to make preference orderings of "prospects" (images of future states of affairs). In some sense he is future-oriented, the question of how far he looks into the future while still visualising himself as an efficacious actor is of equal and crucial importance.

The future beyond which a person does not take account is beyond his time Horizon; the horizon is a crucial factor in fixing the terms on which he trades present for future
satisfactions. It governs therefore his **general life pattern of time within which time-budgets will be described and social/psychological aspects become pertinent.** It might be thought of as the containerisation of the life resource of time so as to decide among many alternatives, to decide what pattern of expenditure of the daily resource of time is most applicable and permissible. The individual therefore not only expends time in observable configuration and according, on occasion, to sequential rules, but has prior rules and personal decisions which lead to a choice of the **kinds of time expenditures** which are later susceptible to those configurations etc. (see Diagram 1). How does he arrive at these general, individual, time dicta or allocations, (levels 1 and 2, Diagram 1)?

First, what we have referred to as a choice among alternatives is in fact a limited proposition, the individual's ability to choose is governed by (1) his psychological set, and/or (2) skills, abilities and cultural background. Authors have settled on either (1) or (2) as explanatory of life pattern time choices, but few see them as constituents of the same phenomenon.

Banfield, for example, refers to the individual's free time as a "completely subjective orientation," and Martineau is able to summarise "certain psychological differences or contrasts between social groups." Both
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**NOTE:** By virtue of his Time Horizon an individual (or firm etc.) establishes certain preferred patterns or ways of expending Time.

Having decided on a general pattern (which is probably a permissible one decided by his social group etc., rather than one chosen rationally from consideration of alternatives), he acts out appropriate day to day Time Budgets.

**THE SEQUENCE LEADING TO THE TIME BUDGET OF DAY TO DAY TIME EXPENDITURE**

**DIAGRAM I.**
then examine how this psychology (or life time pattern choice) expresses itself in time expenditure; their model of action is,

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Evidently, this model does not explain how the time Horizon is formulated as a prior condition to the choice of time expenditures. Anthropologists, featuring the cultural variables (preference 2) see the Horizon as the result or at least the concomitant of certain values, teachings and prior time expenditures which vary fairly constantly by class and social group.* In the course of their writings, White, Horton and Henry reformulate the model as below:

*This viewpoint tends (as does Banfield's) to encourage authors to beg the question of objective situation (physical, social etc.) in relation to class or generalised social group. It does not examine situation as an integral influence on TH, but as (tacit) complement to it. Though the viewpoint is on occasion the basis for policy (e.g., welfare colonialism) which seeks to change TH so as to affect behavior (e.g., stop riots), there is no indication of just how situation changes (model cities, job training) interact with the goal of behavioral change. (As extreme example the middle class boy (with long TH) who becomes markedly present-oriented in Vietnam would suggest examination of the relevance of this viewpoint in relation to varied situational conditions.)
This will be our choice of model. It suggests some evidence encouraging to our aim of relating time and activities. That is, that the general temporal framework by which people are contained and within which they see themselves acting constrains the range of activity upon which they engage: lower class lack of emphasis on schools for example, will result in low achievement which reinforces the notion of a job with limited continuity and future orientation. This is further developed.

It is interesting, finally, to record Martineau's summaries (of research) by class: 11

**Middle Class:**

1) Pointed to the future,
2) Viewpoint embraces a long expanse of time,
3) A well-structured sense of the universe,
4) Horizons extended or not limited,
5) Greater sense of choice making as to, time expenditure,
6) Abstract in thought,
7) Tied to national happenings.

Lower Status;
1) Pointed to the present and past,
2) Lives and thinks in a short expanse of time,
3) Vague and unclear structuring of the world,
4) Horizons sharply defined and limited,
5) Limited sense of choice-making for time expenditures,
6) Concrete in thought,
7) World revolves around family and body.

They offer some confirmation of our contention that
(1) individuals and groups, with an intimate nexus of a
common and mutually understood rhythm of social activities,
constrain by that intimacy,* the round of behavior and
activity; and that (2) "A man's sense of time derives from
his place in the social structure and his lived experience,"
(Horton). 12 (We have seen that devolving from this nexus
and sense is a pattern of permissible time resource ex-
penditures overlayed and reinforced by social and psycholo-
gical constructs which set the expenditure to fit behavior).

*Clearly, there should be criteria or parameters which can
explain preconditions necessary to the fit of a time pattern
of expenditure and a time budget to a temporal horizon.
These criteria, applied by the individual, might be; aptitude
(does this or that expenditure fit with my T.H.), opportunity
(if it fits, how convenient and permissive is it), constancy
(how long can this apt and opportune fit be maintained)?
(5) Time as Causal Link, in the Description and Measurement of Large Scale Social and Urban Change.

Here we investigate time as setting and time as sequence (the third use of this term).

Time as Setting. Particular periods in time frequently form a backdrop against which events assume differing meanings. Everyone is aware of and has a certain image describing such periods as the Medieval Period, the Renaissance or the Victorian Era. Here time refers to temporally limited structural patterns, value orientations and the like, toward the description of which we might group various representative sets of time-expenditure configurations (by class, for example,) so that particular expenditures are evaluated in terms of their relation to the larger pattern or setting rather than as events independent of it. Historiographers at one extreme tend to focus on time as setting and ignore individual relationships, whereas comparative sociologists at the other extreme, often ignore groupings and patterns of configuration as they tear a particular relationship out of the large tapestry of which it is part. Ideally, time as historical or contemporary setting could serve as a test factor for the particular investigations of the sociologist—i.e., do they occur under this or that grouping or pattern.

All this suggest that an important function of time as setting is to segregate particular patterns of occurrences
or to combine them so that they form a pattern of more extensive representation and relevant to a larger population, defined by group or class or by a specific behavior mode cutting across such boundaries. It suggests, in short, an elaboration of the more familiar method of correlation; is (A) present whenever (B) is present? Do variations in (A) coincide with variations in (B)—or occur following an appropriate time lag? In these questions we are concerned with what is happening at a particular point in time; without the time link the questions would be meaningless.

(Logically, the configuration of one time budget is no less a measure of setting than is a grouping or pattern of budgets, and might be a causal link in the investigation of, say, changes wrought by new technology in the home. We shall confine the use of setting and of sequence (see below) to the analysis of a large scale changes in social structure and urbanisation.)

**Time as Sequence.** We gain more assurance that an observed correlation represents a causal link if we can establish a sequence of events. We want to establish a relationship in the context of consecutive time periods. Certainly there will be many kinds of sequences, (ordered, unordered, etc.), but they will all be modifications of the temporal concepts Before and After, as a means of determining whether A could have caused B. (Again, attention is drawn to the repeated use of Sequence.)
(6) **Time as a Measure of Change, In Small and Large Scale Situations.** We have noted that time-budgets (singly or in aggregate) can be compared over time to note changes in any one expenditure or in the configuration or setting. This opportunity suggests that we might abstract some additional indexes from the time-budget data as measures specific to change. Suggested indexes are, duration, rate, intensity and interplay.  

**Duration** refers to the time-taken in the general scheme of comparison for any 'measured change' in the relative importance of one or a configuration of time expenditures. The criteria by which a change is measured to have taken place can be phenomenological (a large change whose impact can not be disregarded) or arbitrary (as in the decennial periodicity of the Census data). A degree of precision might be obtained by subdividing (arbitrarily) qualitative units (such as phenomenological stages) into equal quantitative units and describing these units in terms of duration. And duration might, in turn, become an important variable in a conceptual scheme. (Attention would obviously be paid to the potential error of inference and deduction based on changes reflected by analysis of different unit lengths--change in the period of a decade might obscure subtle patterns of change by year and by monthly intervals. **Cycles**, which are major variations in a
trend should be distinguished, as should noise, the incon-
sequential perturbations of trend.)

Rate of change can be simply derived from duration
measures—e.g., 18 percent change in 10 years. For inter-
group and inter-cultural comparisons the meaning of rate
easily becomes obscure, due to value differences (etc.) in
the importance attached to and the preference for change.

Rate may take certain forms when quantitatively ex-
pressed; among them are increase, decrease, ordered, un-
ordered, pulsing and stepwise.

Intensity: Heirich observes that "the political surren-
der in war gathers its intensity from its content, and not
from quantity or rate" of time allocations, even though
sequential timing is relevant. Intensity need not therefore
depend on rate and quantity or duration of change but,
rather, on content; a sufficiently large change within a
small unit of time is nevertheless bound to generate
intensity independent of content. (The moment of political
surrender in war, for example, gathers its intensity from
its content, not from quantity or rate, even though sequen-
tial timing is somewhat relevant: the demobilisation of
soldiers upon surrender will generate an intensity markedly
reflected in time-budgets, but with less content importance.)

Remembering that the most likely data source which will be
used to measure change is the time budget and its irregu-
larities, we see that where content is dominant we need to
go beyond time-budget information for some insight into the import of specific occurrences. Fortunately mention has already been made of this information source: it is the overlay of social meaning and sequence (and/or psychological meaning and sequence) to which Aspects (2) and (3) were devoted. But it is to this source in, only, its formulation of culturalia (expressions, attitudes, beliefs) and not in the active expressions of particular social or psychological time expenditures (i.e., social time use). For if these types of expenditure were to be seen they would be reflected as a change in the time-budgets, just as Horton was able to express the low intensity of time use by Negro street dudes as a social time use phenomenon relateable directly to rate and not to content. This is important, intensity derived from content can be explained by meaning and sequence but will not show in the budgets.

There are two measures of intensity of change; one is predominately the intensity of rate of change of time expenditures (demobilisation) the other is related to content (end of war) independent of rate.

(We noted that in the description of time-budgets, How long, How much and How often might be summarised as a measure of intensity (see page 12). This is not, obviously, a measure of intensity of change, but a measure of intensity of continued occurrence. However, it may be observed that the same dual modes of intensity, as a function of
either content or rate, are pertinent to this measure also. The above comments can therefore be addressed both to intensity of occurrence and of change.)

Interplay is closely related to the notions of setting and sequence which we explored under consideration of time as causal link. It is concerned with the length of time that a particular setting of interacting configurations (c.f. previous definition) remains undisturbed, with the sequence of change, and the qualitative differences from setting to new setting. It is thus a general term relevant to the description of qualitative change over time, in which time as causal link and as qualitative measure are used conjointly. By our previous definition of the appropriateness of setting it can be seen that interplay is confined to the change in large scale systems only.

Before giving an example of interplay, brief comment on qualitative time measure may be useful. In fact we have explained it. It is inherent in configuration and sequential rules and in social and psychological descriptions of time. It is the essence of setting and of, necessarily, change in sequence. It is the opportunity of time data, that by aggregation, analysis and comparison, it can be somewhat transformed from the quantitative to the qualitative realm. At least it quickly points to areas requiring qualitative elaboration.
The anthropological work of White can serve as example of interplay. He is a contemporary evolutionist, yet is clearly within the classic tradition. His work makes temporal setting in terms of an inter-related pattern of expected behaviors central to his examination of cultural complexity. Such patterns are seen to change by sequence and evolve as practical solutions to the inventions and innovation of technology. The assumptions of this interplay and of its data descriptions transform White's work from a collection of functional descriptions into the beginning of an explanation of change.

The following diagram illustrates and relates the aspects and terminologies of time which this Section has identified.
Numbers are the aspect numbers used in the text.

**TIME HORIZON (4)**

**SOCIAL AND PSYCHOLOGICAL TIME (2)(3).**

**PATTERN OF TIME EXPENDITURE—Time as a Resource—(1).**

**OPERATIONAL MEASURES OF ASPECTS (2)& (3), can record....**

**MEANING USE**

(see aspects 2x3 for definitions).

Can explain apparent anomalies in periodicity

**TIME BUDGET AS OPERATIONAL MEASURE, can record....**

(1)

(a) what (I)
(b) when
(c) where
(d) with whom
(e) How Long
(f) How Much
(g) How Often
(h) How Regular

**BUDGET CHANGES CAN BE RECORDED AS**

Duration: time taken for change in one component of the T.B., or in Configuration.

Rate: amount of change per duration for part or configuration of T.B.

Intensity: Duration + Rate, unless Content is dominant. If Content is dominant change is best reflected in Meaning and Sequence (6).

**SUMMARY OF LARGE SCALE SYSTEMS**

Time as causal link draws on Configurational summary of these aspects.

(5) Time as causal link draws on several Configurations (and perhaps on Meaning and Sequence) to describe Setting and Sequence

(6) Interplay traces alterations of Setting and Sequence. It is a measure which uses Time qualitatively together with causal properties.

**NOTE:** The three uses of Sequence are Subscripted in order of introduction in the text.
SECTION 2:
ASPECTS OF ACTIVITY
SECTION 2. Aspects of Activity

Frequent reference has been made to activities, generally without any attempt at definition. The following aims at definition and an ordered description of the structure of aspects of activity. Particular attention is given to terminologies and planning concepts about activities and their relation to spatial land uses and occupancy. By way of introduction it may be useful to start from these latter distinctions and, in a sense, first establish what activities are not. We shall do so in a rather circumspect manner, by offering five quotations or (borrowed) observations.

Consider the following conclusion drawn from time-budget data from several U. S. cities. Robinson (of the Survey Research Centre at Michigan), states that "noticeably more travel time was spent by auto-owners than non-owners in our 1965 survey" (compared with 1939, Sorokin), "but the differences are not substantial. This finding and other data on the trend of travel time over the years suggests that while it has been the automobile that has revolutionised life spatially, it has been the television that has reshaped life temporarily."¹ Here is some evidence (or suggestion) of the potential error of an over-focus on spatial aspects of the environment, to the extent that temporal dimensions and overlaps are excluded.
Already (in anticipation!) we can note that how people allocate their time may be a fair indication of the pattern of their activities. This is not, as it might appear, a statement of the obvious—we have just seen that at least one dimension, the spatial, provides an unsatisfactory continuum.

Meier in similar but somewhat more lyrical vein, draws attention to the necessary omissions of our current thinking and research methods. He notes that we record the physical growth of cities, changes in population number and structure and general social and economic change, but that we fail to record and understand the "communications action (everyday interaction)" of living and of change. He sees Time as a dimension sensitive to the allocation of such actions, and proposes an investigation of the communications dynamics of urbanism. He concludes that "we intuitively feel that the degree of physical social and cultural organisation in cities is understated when we express them in terms of the present sets of accounts (land use maps, etc.). At least two dimensions, human time allocation and the communication of cultural images are missing from the available urban accounting system."^{2}

Now, two examples from empirical investigation. One of the most important discoveries of students of Community early in this century was the close inter-relatedness of
the village or city centre and its trade area. "Here was a social reality which appeared on no map, yet its reality could not be denied. It could be revealed, however, by an activity analysis" (Warren). Within and between and beyond the spatial circumferences which typically focus planning attention are continuing occurrences not often revealed by space and form related records. Christaller recognised this other explanatory dimension in his pioneering work on Central Places. He used, variously, the number of long-distance telephone calls made from any given location to one or another Central Place, newspaper distributions and wholesale trade in various commodities, as activity definitions of different 'watersheds' (His understanding of communication dynamics in urbanism predates that of theorists such as Meier--perhaps it will be re-evaluated.)

Finally, Webber's comments on the British New Towns, record that while the towns are highly identified and identifiable spatial units, there is no social or economic constraint (or identity) imposed by any spatial factor--"at this territorial scale, it is apparent that economic and social propinquity is not dependent upon spatial propinquity." He contends that the essential quality of urbanness is here cultural in character, not territorial, and "that these qualities are not necessarily tied to the conceptions that see the city as a spatial phenomenon."
"Spatial separation or propinquity is no longer an accurate indicator of functional relations, and, hence, mere location pattern is no longer an adequate symbol of order." 6

Carrying his remarks to a theoretical level, Webber comes close to the position of Meier: "one pattern of settlement and its internal land use form is superior to another only as it better serves to accommodate ongoing social processes and to further the nonspatial ends of the political community. This rejects the contention that there is an overriding universal spatial or physical aesthetic of urban form." 7

Our concern with activities is not just to point out an extra dimension of the spatial order so that planners may investigate this new direction as simply another refinement or informational input to the typical land use conceptions. Rather, we point to a phenomenon with a particular and important life of its own—to activities occurring across and often independent of the spatial dimension. We will emphasise the fundamental significance of activities for theoretical planning orientations.

For further discussion of activities it is necessary to make the argument more technical and to include extra detail.

Land use as a term originated, possibly, in relation to agriculture. Farm land may be used for growing wheat or corn or for grazing cattle—the emphasis is on the use of the land, or its productive capacity. "What happens
on the land depends on what is taken from the land." In an urban environment emphasis shifts to use on the land for human activities; land is a site rather than a factor of production. Four criteria relevant to the classification of uses on the land may be distinguished:

1. Buildings or other improvements on the land,

2. Occupants or users of land,

3. Major purpose of occupancy of the land,

4. Kind of activities on the land.

Note that we have observed that activities occur as a very special dimension of land use which need not be consonant with its spatial parameters.

The noted authorities on land use and its classification—Mitchell and Rapkin, Rannells, and Guttenberg—adopt the third criterion, major purpose as the most relevant one and introduce the concept of establishment in order to identify the major purpose. Establishments are defined as individuals or groups occupying recognisable places of residence, business etc., within or upon units of land, or, alternatively, as units of land use, classified as to their major activities.
So, the term Activity has been used to encompass both the sense of general purpose and the kinds of activities included within separate general purposes. Mitchell and Rapkin recognise, for example, that one establishment, while serving a single general purpose, may contain several activities. Each of these may be occupiers of a distinct portion of the parcel occupied by the establishment, and the size, spatial pattern, and nature of the use of such portions may be significant factors in the understanding of land use. Guttenberg under the label of 'activity effects' deals with a variety of quantitative aspects. The label attempts to answer such questions as, how much of a given activity, how much traffic, smoke or noise does the activity generate, what is the service radius of the activity?

Both authors are ambiguous, however, as to where the density, coverage of lots and bulk of structure aspects of these land use activities should appear. Should they appear in criterion (4), the kind of activity--size and intensity of use, (Mitchell and Rapkin) and "how much of a given activity" (guttenberg)\(^9\)--or in (1) and (2), the physical dimensions of the physical stock and the description of those who own and use it, in terms of type of occupancy, density etc.

We shall assume that the latter form of inclusion is the more satisfactory. That is, it is assumed that we
know major uses and degrees of use and the spatial division into part uses (the portions of use per component of activity), ownerships, values etc., and that we wish to understand their interaction in terms of activity within (fixed and moving) and between major and constituent uses. We thus confine ourselves, in the main, to nonphysical dynamic aspects of land use and activity which are likely to vary and be of importance in time. The nature of this variation is the substance of further inquiry--some examples may generally illustrate these conceptual notions. (The third example will lead us to the topic of major changes or disruption occurring within the general flux of activities and their importance for land use models.)

Examples: A parcel of land occupied by a large establishment of the electronics industry is likely to contain distinct pieces of land devoted to different sub-uses. Within sub-uses there will be activities associated with a kind of physical structure: (Where appropriate these activities can be linked to details of this structure and its occupancy which are to be embraced by criteria (1) and (2) of our land use classification system). There will be activities such as processing of materials (in a factory), storage of goods (in a warehouse), administration (in an office) and recreation (on a green space) etc. Or, in a residential area there will occur activities such as
recreation (on private or public ground), entertaining and domestic chores (in dwelling units and gardens), storage (in garages) and so forth, all in a complex and subtle routine. *Between* sub-uses there will be activities of both communication and movement; *between main uses* there will be important flow activities often associated with road and transportation land uses (though not necessarily—witness the telephone). And there will be activities, such as pleasure driving, of limited relation to physical structure and physical constraint but occurring within an observable and recordable physical map boundary. These are some of the dimensions which the typical concentration on criteria (1) and (2) tend to omit.

Or more fundamentally, from the point of view of planning, consider the activities of major physical change or location of an establishment, aspects of land use normally omitted from any classification system.* We refer to the process of environmental change encompassing both felt needs for change due to constraints on activity, and adaptation to new activity routines upon change. These are definitely activity aspects pertinent to the urban scene.....As Chapin observes, "planning agencies have jumped directly into land use studies, essentially looking at the effects of activity systems rather than

*And difficult by comparison of maps of an area at different points in time."
seeking to define and understand activities themselves as producers of land use patterns." What might be thought of as the "behavioral antecedents" of location are a range of variables influencing the behavior of users of land uses, which cannot (and, therefore, have not been) adequately represented by constants or by proxies, the usual measures of land use.

Clearly, this example and Chapin's remark brings us from the consideration of what activities are and how they are related to land use, to the consideration of how they act (with other aspects of land use) so as to condition decisions about environmental change and location, and how they are acted upon by processes of (and as the result of) decisions about location and change in the Metropolitan structure. By this definition every activity has a resultant or outcome effect: an activity is entered, experienced and evaluated, and dissatisfaction results in attempted change, the most noticeable of which we have discussed as example—that is, location. Activity routines, we can observe, have a place in land use models for they are dynamic not only in the sense of their volatile and changeable temporal flux but in influential long-term effects on environmental form.

So, in justifying an interest in activities we note that,
a)--they not only help in understanding, by adding an extra dimension to the land use planning task, but

b)--they serve a useful function in modelling and prediction. Both justifications are obviously influential of,

c)--the nature of design and

d)--more sensitive planning control through the development of legislation which includes the activity component. Further, as a component of control, the activity variable is advantageous in being of relevance (and directly relateable) to other factors of land use. It can be linked also to current refinements in the procedures of measuring and controlling these other factors--to the development of performance criteria and the measurement of externalities, for example.

In fine, this study takes the position that the use of land in a metropolitan area is the sum total of man's accommodation of and to activity routines and to his felt needs concerning environmental qualities. It is argued that causes of activity behavior are complexly tied up with daily routines of land users and associated value and policy bases concerning environmental qualities:
it is argued that environmental accommodation and the tipping point in location choices, particularly in advanced societies, is more and more to be found in how well behavior patterns are understood and how sensitive the environment is to the user of space. All this stresses the importance of "stratifying demand for space" along lines sympathetic to activity systems and preference patterns for space users: the emphasis of such an approach goes into factors (such as amenity factors like gardening, access to one's private yacht, or the time neighbors go to bed) which many theorists normally treat as constants or convenient miscellaneous items in their analysis of (adaptation and location of) a firm, a household, or other entities within the city. An analysis of economic models of urban land use patterns proposed by Haig, by Wingo and by Rothenberg indicates that the first omits them, the second has a tentative proxy, and the last attempts, but frankly admits to, the difficulties of their measurement. (Some of those difficulties will hopefully be surmounted by this study.)

Further to this position we should suggest the connection of these behavioral activity antecedents of location and those subsequent to it, to a larger behavioral system and theory which defines the generalities of decisions about the range of activities upon which an individual may engage rather than the way, once generally
chosen, activities are routinised. (In anticipation of following sections we can note that the larger behavioral system is seen as the cultural milieu of norms, skills, environmental conditions, sense of efficacy and so forth, which can perhaps be summarised by an index of time horizon; and that dependent upon it is the specific and more changeable activity routine measured, perhaps, by the time-budget. As noted, our aim will be to investigate the applicability of a time related measure to sequential stages of decision in the behavioral/activity process.)

The stage set and generalities of intent over, let us turn to the aspects of activity, their individual explanation and structure. In order (from a conceptual viewpoint) they are:

<table>
<thead>
<tr>
<th>ACTIVITY DESCRIPTION</th>
<th>(1) --Province</th>
</tr>
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<tbody>
<tr>
<td>(A)</td>
<td></td>
</tr>
<tr>
<td>(2)a--Affinity (or Commonality)</td>
<td>Temporal</td>
</tr>
<tr>
<td>(2)b--Insularity (or Segregation)</td>
<td>Grain</td>
</tr>
<tr>
<td>(3) --Focality (or Nucleation)</td>
<td>Temporal</td>
</tr>
<tr>
<td>(4) --Dispersion (or Concentration)</td>
<td>Organisation</td>
</tr>
<tr>
<td>(5) --Type</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>(6)a--Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(B)</td>
<td>(6)b--Contact (or Association)</td>
</tr>
<tr>
<td></td>
<td>(7)a--Communication</td>
</tr>
<tr>
<td></td>
<td>(7)b--Movement</td>
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<tr>
<td></td>
<td>(8) --Volatility (short-run Variation)</td>
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<tr>
<td></td>
<td>(9) --Dynamism (long-run Alteration or Change)</td>
</tr>
<tr>
<td></td>
<td>(10) --Motivation and Value</td>
</tr>
</tbody>
</table>
(11) --For the situation or--Integration, occasion (situations occur within social occasions) Break-up etc.

(12) --For the Activity--------Disruption, Routines Volatility, etc.

(13) --For the Interactants-----Satisfaction, Affect, Control, Support, etc.

(14) --For the Establishment----Instruction, Integration etc.

(15) --For the culture---------Rumor, Myth, Mutual Support

(16) --Made by Planning agency with respect to Goals and objectives (for various scales of planning).

Before explanation of each aspect, a word on (a) the general scheme of division--Description, Inputs, Outputs, and (b) its relationship to the choice of terminology.

(a)--In intent, Description is straightforward. We want to know something of the general nature of the actor and of the activity so that they may be generally classified. It will be shown that this classification can occur independent of consideration of inputs and outputs--just as we can partially classify uses without inclusion of occupancy or density measures.

The Input-output scheme has previously been hinted by our suggestion that activity routines are actively
appraised so as to implicate adaptation, change within uses and location. A comment by Heirich is pertinent to this point--"to be conceptually useful, allocation of time (an input)" or other resources, must "be linked to output from time use. An activity may not have diminished in importance, if less time (etc.) is spent on it but the same output is maintained."\(^{13}\)

This conceptual distinction is very important to the remainder of the study, and essential, it is suggested, to the general study of activity routines. It enables us to think and argue clearly as to the difference between a person's contribution to activity (time, money, self, assets, energy), and his expected or explicit returns (in terms of satisfaction, contact, effect on future activities etc.). The concept dichotomises the variable activity and locates its aspects in such a way that the positional relevance of various pieces of research, now fragmentary, may be easily comprehended. (Clearly the nature of an activity and its input-output value might be measured, in part, along a time dimension: this is not to be decided here, it should not be inferred from the above quotation that it is the only or best measure. Cursory examination shows, for example, that time is only tangential to aspects 12, 14 and 15.)

(b)--The above distinctions have led to the use of certain terminologies and an overall typology of aspects
which are at variance somewhat with those of other authors who, by comparison, tend to be specific in their delineation of relevant aspects of activity. We shall use activity and activity routines in a sense which, for other authors, is equivalent to or subsumes,

1) Interaction (sometimes with particular reference to Participation),
2) Transaction (or Interchange),
3) Communication, and
4) Activity system, Activity Pattern etc...

--Interaction, interpreted loosely, is any form of involvement between actor and environment and actor and actor. For our purposes it would seem to be an adequate substitute for activity: semantic suggestiveness is its only failing. Thus, at one extreme it might be a catch-all including all our aspects (and more) of activity, at the other it might be specifically related only to, say, participation.

--Meier suggests that transaction is a completed circuit of interaction. How do we measure an interaction as complete and thereby distinguish transaction from interaction? A man sitting in solitude (a recognisable activity) completes his circuit of interaction upon cessation of reflection, but what measure would contain and reflect this activity as complete? Either
we recognise that philosophically all interaction is transaction or we confine counting and categorising of transactions to sociocultural interchange at the macro level. The latter limitation precludes sensitivity to many of the overlays of land use which are qualitatively and quantitatively important to it, and should, therefore, be included in both conceptual and operational schemes. We shall choose the former alternative--i.e., transaction = interaction (or a part of it) = activity.

(It is Meier's misfortune that he thus delimits his conceptual scheme, so concentrating on the properties of the transaction itself, to the exclusion of a satisfactory scheme for description and the understanding of output.)

Chapin refers to interaction patterns or behavior patterns (the "rational and overt forms of interaction") in a manner that is fairly comprehensive. He subdivides interaction, however, into activities (within place interaction) and communications (between place interaction). This is a division deriving from a spatial notion based, possibly, on Lynch's adapted space/flow space typology. Consider, alternatively, the general measure of activities in Time, not in space--we might include both of the interaction types noted by Chapin along the one dimension, and we would not limit ourselves to the measurement (and notion) of communication as a between place activity when,
in fact, it can be an important component of within place occurrences. We expand the activity spectrum beyond spatial constraints or as overlays to them: thus we need not arbitrarily define what is within or what is between place, or what is (in some instances) place. We shall further examine classification of activities in Time and not in Space.

*Communication,* is here included as but one aspect of activity.

In the main, objection to *system* and *pattern* is emotional. Both words convey overtones of activity interdependency and resolution, tending toward the static.

*Routine* is designed to reflect a process which is stochastic save in its continuity of procedure. The term is unsatisfactory in its suggestion of repetition of the same process. Unpredictability of activity situations should be emphasised, but not without some notion of the daily round of life. (*Activity Scenario* would be an acceptable alternative.)

*Aspects of Activity, an Explanation.* (Obviously some of the aspects below are directly measurable by Time; again (!) we will leave the explicit statement of these relationships until Section 3)

*Province* (1--Descriptive Aspect): identifies the actor and some general information which will allow him to
be placed in a spectrum of importance and potential influence. Public-private, might be a primary division followed by classification parallel and complementary to any land use (criteria (1), (2) and (3)) system. The areas of responsibility and authority of the actor as well as that of beholdenness should be included. Some general indication of activity effect relating to changes in Province (from public to private, for example) will be applicable: the individual's dominant modes of public/private activity might, for example, be recorded by indexes weighted as to total time spent on each.

Evidently, some indication of Province is included in Land use criteria (1), (2) and (3), but it is not likely to be directly related to activities. Thus, a Land use classification system might identify 'a single family detached dwelling unit residential area.' But where and when do constituents of the family, children say, choose to play, in public or private area. Then, what is their activity like; the following describes.

Affinity ((2)a--Description): is the activity isolated and unique or, alternatively, sympathetic and common to its neighboring and associated activity milieu? Isolation or commonality could be measured by a number of criteria according as to how likeness of activities is identified--by 1) type (work or play, for example),
2) occurrence in a spatial location, 3) by time taken, 4) by time of day, etc.

Number 3), time taken will be used as the most apt criterion.

Separation by type, criterion (1), involves either a superficial, limited classification within which there will necessarily be many unaccounted subtleties or, alternatively, a very detailed classification offering too many inter-activity permutations. The International Time-Budget study found, for example, that activities could only be efficiently classified into 96 specific types and no fewer than 27 general ones\(^\text{16}\)--the permutations within even 27 categories are obviously prohibitive. In contrast, time-taken can be categorised into various units depending on the nature of the investigation and on the activities in question--5 minute interval units for one situation, or hourly divisions for another. The permutations can be as limited or comprehensive as desired, depending on the length of interval chosen.

Also, when concerned with change (and volatility), this criterion overcomes the potential error of functional equivalence by which change in the nature of any function (or type of activity) is shown to be of small magnitude (or otherwise) without recognition that major change has occurred in the nonfunctional equivalents. The fact that
television, for example, now uses up some of the time formerly spent on equivalent media activities, such as reading, cinema-going and radio listening may be less significant than the fact that T.V. also uses up time formerly spent at work, sleeping, or on family conversation. 17 (Further, it is a continuum offering a direct comparability of the quantifiable importance of activities; this is not offered by Affinity of Type.)

Number 2), separation by spatial location, introduces variables which we have assumed to be included in other land use criteria. Separation by time of day, number 4), is increasingly an insensitive measure as activities become more flexible as to occurrence.

**Insularity ((2)b--Description):** At what point does the temporal commonality or affinity decompose. We can develop categories of this aspect by time,--how long is affinity maintained. The dimensions of the categories of insularity and their cut off points are not here considered. Activities are grouped by Affinity and surrounded by boundaries defining Insularity. (The notions (2)a and (2)b) are integral, and make distinction only as to (a) how to bring activities into groups and (b) define groups one from another.)

((2)a and (2)b, may provide a measure of Temporal Grain.)
Focality ((3) --Description): Irrespective of affinity or Insularity, what is the propensity of activities to occur in concert, both in Time and in Space? A given area may have many activities occurring at one point in time although they are not spatially focal, and vice versa. The following page of illustrations should further explain aspects 1, 2 and 3.

Dispersion ((4) --Description) of the activities of various actors, rather than the total of activities: Are the activities of any individual actor dispersed in space and, possibly, in time (e.g., a shop might be open only in the morning and evenings, a school bus would be utilised in the morning and afternoon only): Aspects 1, 2 and 3 examine activity routines across a given area as they change in time and space; this is the general design of the activity carpet. Aspect 4 seeks to pick out important and representative individual threads to see how they are woven across it—and how they bind it together. Obviously in the temporal measurement of personal activities dispersion is irrelevant because time must be continuously expended in the process of living. Some distinction by time of day when the most activity is undertaken might, however, be applicable.

The spatial focality of the total of activities of various actors will be a measure of degree of Localism, or Realm.
TIME TAKEN FOR AN ACTIVITY

AFFINITY BOUNDARIES ESTABLISH GENERAL INSULARITY

MAINTENANCE OF INSULARITY, AS ABOVE, THROUGHOUT THE DAY

IF THE AFFINITY OR INSULARITY BOUNDARY VARIES GREATLY FROM DAY TO DAY THE ACTIVITY IS VOLATILE--SEE(8)

A DIURNAL MEASURE OF TIMES OF USE (AS OPPOSED TO THE CHARACTERISTICS OF THE USE OF TIME ABOVE, (2)a AND (2)b.)
Type ((5) --Description): A general classification by type of activity taking place over the spatial area considered. This is clearly an adjunct to any land use classification and should be related to it. The classification can be as detailed in the categories it contains as the situation demands. There will be no permutations between categories, the Affinity measure encompasses this.

Participation ((6)a--INPUT): How many people participate, defined by age, sex, class, ethnicity, rate or whatever. (Class subsumes some method of distinguishing characteristics of occupation, income, education etc.)

Also, what are the realms of interaction in participation--the individual alone; individual to individual, to group, or to group in a larger social milieu.

Contact ((6)b--INPUT): Complementary to (6)a is the notion of contact among actors defined by the specific inter-personal relationships between social actors. It is a specific refinement omitted from the general measures of universal (applicable to all situations) attributes of Participation. Thus an individual may participate in a small group acting in a larger social gathering, in a cinema say, where communication (see 7) would be commonly agreed to be the film presentation. But contact (being with) a close friend or spouse during that communication can not be neglected as an input to the activity. It is,
on one hand, a form of (in this case unspoken) communication, while on the other hand, it constitutes an essential element of event Participation.

Contact can be readily measured on a list, perhaps a scale, of relationship attributes of participants. Reference to authority, responsibility and control structures as they affect participants should also be made.

**Communication and Movement** ((7)a + (7)b--INPUT): What products or services (or emotions?) are transacted or modified? Also how much is transferred; can the quantity be described to include mass and energy components? How valuable is the activity measured in monentary units or in time spent (though this measure, as we noted, may be insensitive to functional equivalents), or How informative is the communication measured or estimated by the surprise value of the cultural images or symbols used in the course of transmission.

Meier warns that operationally it is better not to try to count private or secret exchanges between members in a household or in a group since the report to observers, if given, is privileged. More realistically they are probably just too difficult to account; planning, as here defined is only peripherally concerned with such communication modes. None the less it must be alert to their importance (which is often marked); a useful indication of this
importance will be given by data on Motivation and Value. Thus, if a private activity is highly valued its communication may be vital--this is only inference, but repeated observation of the same characteristic in the data will give some reassurance of its validity.

We shall return to the complexity of communication measurement in later sections, with particular reference to aspects of multi-party, multi-level interaction, and the extent of communication as it is relevant to planning.

It is interesting that, logically, communication is the link between Input and Output, without it there can be no output. This perhaps is suggestive for later measurement studies. Also, as shown, communication is integrally linked to Participation and Contact; cessation of one or (necessarily) all of these aspects therefore represents termination of activity, elimination of actor, or migration (with or without replacement).

Volatility ((8) --INPUT): What is the propensity for certain one or a set of activities to fluctuate (in characteristics) noticeably over short periods, as distinct from long term or major changes over time. Simple measures of volatility described by variation in mapped Affinity could be readily devised.

Dynamism ((9) --INPUT): This is the process of development or change from one state to another. It may be preceded by noticeable volatility or may be an erratic process
of alteration; some indication of the process of change is, therefore, applicable.

**Volatility and Dynamism:** We have seen in the consideration of measuring change in respect of time that several measures of change are valid, (rate, intensity, duration); these same measures can here apply to Aspects (8) and (9). Also observed was the variation in saliency of various aspects of Time according to the situation of interest—social meaning might, for example, be more explanatory than the bald description of time expenditure. So it is that a change in activities may be best or adequately described by a change in participation, or any one or a combination of aspects. In some instances a change in one aspect will necessarily involve change in a set of others, and we should be alert to checking the frequency and constancy of such changes with a view to developing summary indicators in the form of one aspect which will suggest changes in others, but without requiring their measurement.

**Motivation (9) and Value (10).** (INPUTS): We know that many activities are performed, in large part, without conscious motive, that individuals act without much thought or premeditation. Also we know that certain activities fulfill many obvious or direct motives, such as eating for the satisfaction of hunger, or selling to make money. Still other activities are not what they seem but are a cloak for the acting out of motives not endemic to them.
From a planning standpoint, not a psychological or sociological one (which would focus on the Why and mechanism of the Motive-Action process), flexibility will be introduced into design and control if it is known that certain activities commonly accommodate a range of motives or that a particular motive can find expression in any of a range of activities. Thus, if motives were predominately reported as personal but found expression in economic or societal activities only, we might infer that the activity routine lacked in variety and choice for a certain sector of participants.

Value, is confined specifically to the choices which people make in respect to the activities they would ideally pursue if granted more free time. This allows some input for forecasting and modelling and suggests, by indicating favored activities, which components in the existing routines are highly valued, or not valued, or open to devaluation. The question of how values influence the choice of one dominant mode of activity routine from among the many which exist as representatives of different life styles is not considered; the consideration of Life Pattern Time is, however, hint of the manner of its inclusion. We concentrate in Aspect (10) on the value attached to selected activities within the compass of the routine rather than how the total of the routine might attract value convictions.
OUTPUTS: will receive cursory examination. The main purpose is here to reiterate the importance of the process of activity evaluation, and having done so to state that they will not here receive any further attention in detail form. It can be warned, however, that a planning focus on Output evaluation is a specifically oriented one, concentrating perhaps on general satisfaction, development of skills, improvement of self concept (?) etc., but not on any of the concerns necessary to a social/psychological perspective of activity, such as degree of involvement, resulting tightness-looseness of the situation, development of resources for sanctioning etc. The Outputs should ideally be relateable to other land use aspects and be a fairly 'hard' input to recording, design and modelling schemes.

JUDGEMENTS: the final stage in applying this scheme would be the assessment of gathered data as to its attributes and as to the way that it is in line with the goals and design of the Comprehensive Plan (and its Area and Neighborhood components). These obviously vary by situation but some of the most general goals against which to evaluate routines might be,

--Efficiency; does the spatial arrangement and its activity impose overload or disproportionate expenditures of time, money, energy etc. Accessibility and Convenience are pertinent parallels,
--Degree of Determinism; to what extent are (the activities, though perhaps efficient, organised so as to permit of individual expression in their acceptance, modification and rejection,
--Degree of Pluralism; is a nondetermined individualism to be accepted within the framework of a few or a variety and choice of activity routine opportunities and possibilities,
--Effectiveness; how do they act to maintain, for example, Health, Safety, Welfare and Morals,
--(etc.).

The foregoing is a general and sometimes brief examination of salient features of activity. As yet no concise argument has been forwarded as to why the Activity/Time fit is to be recommended, though obvious hints, deduction and intuition will have identified reasons and instances in its favor.

The following two sections are addressed to the justification of this fit.

Section 3 turns to the details of relating the variables at both a conceptual and an operational level: Section 4 reports a test case of part of the conceptual/operational scheme which Section 3 evolves. Both sections make use of the lesson (in terms of face Validity) of Appendix I which looks at how previous research has combined Time and Activity and how in doing so it has been able to draw in the various aspects of both variables.
Before closing the section, it may be useful to observe that the 'salient' features of activity which we have identified and the structure with which we have linked them will necessarily influence, if used in a planning situation, the way in which aspects of 'community' are conceptualised and measured. Though many aspects of Urbanism and Community have been included in the scope of the activity structure it does not give explicit attention to, for example, the full range of: 19

-- Community as Space (criteria (1), (2) and (3) of land use),
-- Community as People (kinds, and their life patterns),
-- Community as Shared Values and Institutions,
-- Community as a Distribution of Power,
-- Community as a Social System,
-- The Fashionable distinction of Community (vs. larger society) Action.

Clearly, some aspects of activity are related to these alternative viewpoints—the aspect of communication and the socialisation process which is usually included in a social system description is an example. The hope is that the selected activity aspects will provide contingent points for the linking of a variety of conceptual and empirical questions resulting from a range of differing viewpoints. Our specific interests here relate to behavior and the
processual aspects of institutions and other urban entities; from a consideration of the omissions of land use classification and design, we identified the activity variable which was, in turn, seen to presume certain behavioral biases—motivation, participation, communication and value being the most prominent. Albeit these biases are limited to a very crude level of behavioral explanation; our practical planning constraints demand this.

But the behavioral/activity bias suggests that we might identify not only what and how activities take place but also why, defined by class, a certain range and pattern of activities is decided—very much in the way that we moved from a factual time-budget description to a Time Horizon (or prior determinant) affecting the actuality of expenditures. It will be useful for planning to know of constraints on behavior occurring by virtue of a prior definition which decides which activities are permissible or pertinent, rather than to know only how activities are, in realisation, patterned and varied with respect to their aspects. That is, to draw in some of the cultural determinants of activity. (The following diagram explains this conceptual step, though it offers no operational methods for its quantification. Section 3 will include further reference to it.)
SECTION 3:
TIME AND ACTIVITIES,
SOME THEORETICAL AND
OPERATIONAL CONSTRUCTS
SECTION 3: Time and Activities, Some Theoretical and Operational Constructs.

We are now in a position to bring together and relate the various concerns of both Time and Activities. We shall do so with the aid of two diagrams representing two states,

(1) Conceptual Relationship
(2) Operational Relationship.

The questions related to each stage are:

(1) (obviously), How can the aspects of Time be integrated with those of Activity at a general Theoretical level.

(2) If an aspect of Activity is to be measured in order to gain information pertinent to it (see definitions), how effective will the Time variable be in identifying salient information.

All the components in both diagrams should be familiar, it is their positional characteristics which may be new and unexplained. In cases where these characteristics are thought to be difficult or contentious a brief explication will be included. But generally it is intended that this section be a summary or brief clarification of the hints and images and distinctions (and nuances?) which have packed the course of the text, especially Section 1. It is thought of as the denouement rather than as a continuing part of the exposition. (See Diagram 1).
ACCEPTABLE OR PERMISSIBLE, GENERAL ACTIVITIES (e.g. acceptance of long years of schooling in the knowledge of later reward).

Note: Activity DESCRIPTION is an operational rather than a conceptual stage. It is included for clarity.

One Way Connection

Two Way Connection

Aspects considered in detail at the operational level, see Diagram 2.
We can translate the theoretical scheme (Diagram 1) at the conceptual level into an operational scheme aimed at the measurement of aspects of Time and Activity--i.e., the measurement of components of the theoretical scheme (Diagram 2).

In so doing, we will translate only part of the general scheme into operational terms: we include Description, Inputs (Activity) and Time Budgets, and exclude Time Horizon, Pattern, Social and Psychological Time, and Activity Outputs. This pruning is necessary because of constraints of both time and expertise (related to knowledge and understanding of the Aspects omitted). We are foregoing, therefore, (1) an explanation of why the Time budgets of Activities representative of different groups and populations include unique routines, (2) a measure of Output and also of the degree to which the total activity satisfies or conforms to specifications made by the temporal pattern, thus precluding the development of a continuing inventory serving as "an advance warning system" (Chapin) for anticipating changes in the locus and nature of activity routines.

The diagram on the following page is at the operational level. It indicates that the apparent neatness of the theoretical formulation is somewhat overstated. For a precise statement of theory we would have to rewrite
<table>
<thead>
<tr>
<th>ACTIVITY ASPECTS</th>
<th>Appropriate Measure</th>
<th>EQUIVALENCE</th>
<th>Appropriate Measure</th>
<th>TIME BUDGET</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROVINCE (1)</td>
<td>Census, full sample</td>
<td>Survey</td>
<td>Survey</td>
<td>WHAT (a)</td>
</tr>
<tr>
<td>AFFINITY (2a)</td>
<td>as above</td>
<td></td>
<td>Unobtrusive Measure</td>
<td>WHEN (b)</td>
</tr>
<tr>
<td>INSULARITY (2b)</td>
<td>as above</td>
<td></td>
<td>as above</td>
<td>WHERE (c)</td>
</tr>
<tr>
<td>FOCALITY (3)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>WITH WHOM (d)</td>
</tr>
<tr>
<td>DISPERSION (4)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>HOW LONG (e)</td>
</tr>
<tr>
<td>TYPE (5)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>HOW MUCH (f)</td>
</tr>
<tr>
<td>PARTICIPATION (6a)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>HOW OFTEN (g)</td>
</tr>
<tr>
<td>CONTACT (6b)</td>
<td>Survey</td>
<td></td>
<td>Survey</td>
<td>HOW REGULAR (h)</td>
</tr>
<tr>
<td>COMMUNICATION (7a)</td>
<td>as above</td>
<td></td>
<td>Unobtrusive Measure</td>
<td>DURATION</td>
</tr>
<tr>
<td>MOVEMENT (7b)</td>
<td>as above</td>
<td></td>
<td>&quot;</td>
<td>RATE</td>
</tr>
<tr>
<td>VOLATILITY (8)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>INTENSITY</td>
</tr>
<tr>
<td>DYNAMISM (9)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>MOTIVATION (10a)</td>
<td>&quot;</td>
<td></td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>VALUE (10b)</td>
<td>&quot;</td>
<td></td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>CONFIGURATION (summary of 6 through 10)</td>
<td>no measure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Diagram 2.**

**Note:** Intensity measure is independent of content; see Section I.

**Relationships:** Defined operationally, between some variables of the time/activity scheme.
Diagram I identifying the specific relationships in the boxes. Time does not explain every Activity; the explanation of Activities employs time in a useful and economical fashion but it also requires further measures for its full explanation.

It has been a long way to this simple summary. It is hoped that en route certain myths and commonly accepted notions have been laid, and that some structure and clarity has been revealed.

Comment on the Operational Scheme (See Diagram 2): at this point we are examining the specific extent of a relationship; we see that there are a number of useful and clear commonalities. But equivalence depends somewhat on the choice of measure, so we shall first explain the choice of the measures proposed.

It will be seen that the measures for Descriptive aspects of Activity are the exceptions to a general rule of survey techniques, they emphasise a comprehensive or total knowledge (of Affinity, Insularity, etc.) of activities over any planning area under consideration, within reason of time and cost. Their distinction: results from the viewing of Descriptive aspects as the setting of a scene, later to be filled out by elaborative knowledge (Input and Output) in much the same way that a typical
Land Use classification identifies pattern generalities requiring qualification as to, say, Structural condition, aspects of design (color, texture, materials), taxable value, and activities. Description is, then, the comprehensive work of an Activity study: the reason that a partial relationship only is shown between the first five aspects of time-budgets and those of activity is that the time-budget approach is seen as a survey (limited to samples allowing for generalisation) approach providing only partial (by volume) information to a full area census. The five aspects of What, When, etc., are, however, none the less crucial to the study of activity, and are synonymous with activity Description; it is just that as part of a census survey of activities they can not also be part of the usual time-budget survey technique. We might rewrite the scheme as,

**DIAGRAM 3**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Measure</th>
<th>Equivalence</th>
<th>Measure</th>
<th>Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROVINCE</td>
<td>Census</td>
<td></td>
<td>1 Census</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Unobtrusive survey</td>
<td></td>
</tr>
<tr>
<td>AFFINITY</td>
<td>Census</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>INSULARITY</td>
<td>Census</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FOCALITY</td>
<td>Census</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td>etc.</td>
<td></td>
</tr>
</tbody>
</table>
Obviously, if the Input aspects were also to be measured by census, the time-budget aspects would similarly require to be applied comprehensively (i.e., in all situations, not just in samples).

Many aspects of both variables are well linked. Two survey methods for measuring each aspect are suggested as indication that alternative approaches to the recording of the same phenomena (which might be correlated as a validity exercise) do not greatly affect the nature of the links to be drawn between aspects.

Some aspects are not strongly linked; i.e., Equivalence is poor, and a satisfactory explanation of the activity aspect would require additional information not offered by a time-budget record. Let us look at these poor links, identify missing information and ways that it might be obtained. This will be a sketchy review, to be given more substance in Section 4 and Appendix II.

Contact: it is unlikely that the simple notion and question 'With Whom', gives sufficient information about Contact, the activity aspect. Or, more properly, it does not sufficiently exploit this area of time enquiry as it relates to Contact. We might expand the question 'With Whom' so as to measure Contact in the following fashion:
(0) Alone

Primary Contacts
(1) Intimate Kinship, such as nuclear family members and extended kin members.
(1-4) Close Intimate friends, friends defined as 'very close', 'my best friend', etc.
(3) Close Associate or Client, a close friend deriving from a work context, whether or not actually seen at work.
(4) Good friend, a friend defined as 'close,' 'just a good friend,' etc.

Secondary Contacts
(5) Distant Associate or Casual acquaintance, either, a fellow worker who is not defined as a friend, or a person with whom one has a "speaking acquaintance."
(6) Cordial Recognition, defined as a person whom one recognises in address, or "just someone I say hello to."
(7) Pure Client, defined as a person whom one doesn't know personally, but one with whom interaction takes place in a client relationship.
(8) Strangers.
The above are Individual or Group Contact Categories. Other classifications would be necessary for Firms or Institution records; none are here included. Additional questions could determine authority exercised by or responsibility toward the reported contacts.

In a strict sense, asking respondents to allocate contact time (in the time-budget of activity) to persons with whom one has a particular qualitative relationship, will identify information supplementary to the numerical structure provided by participation. The quality and communication content of the activity are not usually known at this point.

**Communication and Movement:** This is not measured by Time-Budgets. Again, let us concentrate only on the individual (or household) or group as respondent to a survey on activities. We can then note the special interests and investigation which would require to be devoted to firms institutions and so forth, as exception to an 'Individual Respondent' survey.

We can divide Communication into four 'sub-aspects.'
1) **Direction:**

![Diagram 4](image)

---The composition of any 'Group' is defined by Participation and Contact,

---(8), (9) and (10) are Individual in or with Group acting on Environment, Individual or another Group. Individual with Environment communicating to another Individual or Group is not included here because it is included in Mode, (see below) in which the environment is interpreted as an instrument.

---Individual with Individual, to Group or Environment is not shown because two individuals are defined as a Group,

---(5) is Individual to Self; contemplation, reading, being alone, etc.,
2) **Mode;**
   (a) By word,  
   (b) By action (demonstrative only),  
   (c) By word and Action,  
   (d) By sounds other than verbal,  
   (e) By Action with Instrument or the Environment,  
      Combinations of (a), (b), (d) and (e),  

3) **Movement (and Exchange);**
   (a) of Information,  
   (b) of Goods,  
   (c) of People,  
   (d) Inconsequential exchange (pleasantries, etc.),  
      unrelated to specific areas or disciplines of  
      knowledge.  
      Combinations of (a), (b), (c), (d),  

4) **Main Contribution;**
   (a) to Economic Functions  
   (b) To Social Exchange and Cohesion  
   (c) to Psychological well-being (?)  
   (d) (Perhaps an analytic judgement of the researcher).  
     etc.  

   An operational measure for Communication would include  
these sub-aspects. We will not look at the wording or  
method of formulation.  

   The sub-aspects omit measures of value (of product  
exchanged, for example) in economic terms, and notions of
mass and energy expenditure other than those contained in the allocation of time, participation and contact. These omissions are defended on the grounds of being more pertinent to firm and Institution activities.

Notions of (for instance) information content and social exchange, though included in the sub-aspects are easier to suggest than to operationalise. Crude (though sometimes exhaustive) measuring techniques are available, ranging from open-ended questions to semantic differential scales, to question sets (as a measure of construct validity) in questionnaire formulation, etc. It can be cautioned, without examining these techniques, that the sophistication of the measure need not exceed that of the problem.

Thus it will only be important to know (i.e., measure) the general nature of, say, social exchange; whether this is in fact meaningful exchange is not at issue, it is a question probably requiring research beyond the cost/objective/benefit framework of our concerns. If, subsequent to research on the general nature of the subject, our goal became the fostering of all possible social communication and exchange, the sensitive design of an environment accommodating and responsive to these aspects would be a contribution "undoubtedly" to meaningfulness, but would not derive from an analysis of that meaningfulness. Our tasks are by nature indirect to certain issues.
Motivation and Value: these aspects are not measured by any aspect of time-budgets. They require additional techniques. Again, our concern at this point is to note the exception rather than supply the technique of measurement. We might suggest, however, as evidence of the possibility of measurement, Sorokin's work on Motivation, and Chapin's and Foote's study of Values.

Sorokin asked simply, "Why did you engage in this Activity?" He experienced a satisfactory degree of candour in responses, he listed motivations and matched them against activities to see how patterns of "Activities satisfying Motivations" (and vice versa) evolved.¹

Chapin's study of values is a 'Trading Stamp' game simulation of "What would you do with X extra hours of Free Time?"²

Foote, in his study of household activity routines has used a notion of Preference which is approximate to our particular interpretation of Value.³ His technique is a simple one, but even so it adds a dimensional characteristic to value which Chapin's complex scheme omits. Thus, an individual, faced with the prospect of doing a specific chore for the rest of his life, is loath to categorise this as unpleasant; with rare exceptions, these activities are described as routine or necessary. The preference rating in this study first asked the respondent if a certain activity was a routine one, then questioned whether
it was something that they liked or disliked. Chapin offered his respondents several free hours to be filled as they wished (within the constraint of certain rules)—naturally, highly valued (preferred) activities were projected, but we cannot infer that the others were disliked, or that the valued ones would remain constantly preferential over time.

Foote's method, through recognising the difficulty of categorisation by the individual, probably introduces some bias. None the less, a comparison of the preference rating of the different activities closely confirms the expected. The usefulness of the Preference method is the inclusion of other activities (mentioned in comparison) where personal attitudes would not normally be well known. (The International Time Budget Survey adopts a technique similar to that developed by Foote.)

Both methods have the disadvantage of working with a prescribed list of activities which might constrain responses—the respondent might value highly an activity excluded from the questionnaire schemes. Thus, Chapin lists the possible activities upon which hypothetical extra free hours (trading stamps) can be spent. Foote enquires only about activities mentioned on the diary day, which, though hopefully typical of the way time is generally routinised, are unlikely to include all important activities that gather value sentiments.
Configuration: a partial relationship between Configurations is shown because, simply, the Configuration resulting from time-budget analysis may not include the Contact, Communication, Motivation and Value aspects which we have just seen to require separate Measurement. A configuration of all Input aspects of activity would imply a more complete and sensitive analysis than one summarising activity on the basis of time-budget data only.

These, then, are the few exceptions apparent in an operational level comparison of selected aspects of time and activity.

In essence, the summary of the study thus far is that aspects of time in the behavioral sense advocated by Kant and Paget and the psychologists have an important association with activities and their analysis (which describes the behavioral and processual aspects of life but omits power relationships, shared values and so forth). The essence of time is change, and activities form, by definition, much of the dynamism of change.

At the conceptual level we found a complex but consistent relationship between the aspects of the time and activity variables. At the general operational level which considered but part of the Conceptual scheme there are some exceptions to the nicety of fit between variables. We suggested how these exceptions might be treated.
The following Section is an application of the Operational Scheme (see page 62a) in a Test Case.
SECTION 4:
TEST CASE
SECTION 4: TEST CASE

The Test Case is a practical (operationalised) application of the Time/Activity conceptual scheme developed in Section 3 and summarised in Diagram 2, of that section—this diagram comprises a list of Input aspects of Activity set against a Time Budget scheme. The links between Activity aspects and the Time Budget scheme were drawn, partly, according to relevant operational means; it is therefore imperative to offer this test of linkage, in a real situation, requiring well developed operational measures. We can test the efficacy of the links, evaluate their efficiency, and at the same time obtain data which may be suggestive of planning policy and action.

The test case can be explained as;

(A) the problems attendant upon translating conceptual Time/Activity schemes into General operational terms......................... Methodology

(B) the principles governing formulation of the operational measure, (this operational tool is Sample, reported in detail in Appendix II)................. Validity, Error
Area of Consideration

(C) the selected Respondents and general character of administration of the operational reliability and validity tool in the Test Case.......... in application

(D) Evaluation

(E) Summary and Implications for Planning.

The Test Case is to be of limited extent; it is in effect a pre-test of the operational measures involved. As such there will be a need for caution in data interpretation as it implicates planning policy etc.; it will be suggestive but by no means conclusive.

(A) Problems of Operationalising Time/Activity Concepts:
Virtually all the previous studies have concentrated on the diary as the appropriate instrument for gathering data. Their example is not, obviously, a necessary assumption, but the success of the diary (in terms of richness of data, reliability etc.) is apparently more assured than alternative tools such as participant observation, essay writing, and investigation of public and private records, though these can be used as validity checks or for supplementary evidence to the diary reported data. Qualitative data (gathered by Holistic methods, for example) would be difficult to relate to hard data on use, occupancy, etc.
The diary data can be formulated as an individual would keep a personal diary (the popular diary) or as a structured record to be regularly completed according to instruction! The popular diary is criticised as but a reflection of activities according to their personal importance which catches only the problematic and dramatic episodes of the day, but not the full spectrum of activity characteristics, (important to this study). It is exclusive of time characteristics, such as how long, how often etc., which are here of concern; and recording can be very erratic and uneven over any length of time, or across individuals.

The research (structured) diary is the favored tool; it demands that the respondent co-ordinate the passage of activities with the full flow of time. It is thus more stringent and rigorous than the popular diary.

Variations in the research diary occur with

(1) the number of units into which the days are divided--this is determined by research objectives;

(2) the way in which the data is recorded by the respondent--either by a method in which the respondent reports his activity for each time unit in his own words, (these being later analysed and categorised by the researcher) or by one which requires the respondent to select, from a list of possible activity categories, a description which most closely fits his current activity;
(3) the number of co-ordinates or dimensions of time and activity which are seen to be relevant.

(1) The degree of time division varies widely: Nelson Foote's study of the aged used 5 minute intervals because of its interest in the way old people moved within small scale institutional settings; the International Time Budget Survey used 15 minute intervals because of a more general interest in activity and a more active respondent group; Barker reduces his observation to the minute and second! There is no requirement for the time unit or interval to be constant throughout the day (or week, or month); most authors use longer periods (often of 1 hour) during late evening and nighttime periods because of the generally decreased activity here. But a study could start at a gross level of time division and refine this differentially for further investigations into small and large time unit periods, according as to how the exploratory work suggested bunching or dispersion of activities.

(2) The justifiable fear of the difficulty of reliably classifying diary entries written out in the words (and handwriting) of the respondents is no doubt responsible for the extensive use of precategorised response schedules. But it may very well be that one of the most important questions for study is the appropriate
grouping of concrete data (activities reported without pre-categorisation), and their content analysis. If this question is foreclosed by pre-categorisation it may be that numerous corollary questions are, unintentionally, likewise foreclosed--most important is the preclusion that new kinds of activities and the changing importance of known activities (often reflected in their description) can be revealed by respondent comments. (Certainly our extended scheme which includes activity Outputs would reflect certain change functions independent of respondent diary reporting, but the researcher is, none the less, cut off from a valuable source of concrete evidence rich in information relevant to the study of social change.)

A useful compromise is to obtain concrete data and relate it to a pre-categorised set of activities not shown to the respondent.

(3) The number of aspects of activity and of characteristics of the Time Budget have already been specified. This study, because of its special planning slant, employs a range of aspects more extensive (or, rather, more comprehensive) than many previous Time Budget investigations; Appendix I offers an historical review and comparison of the extent of such studies.

There are, to be sure, many omissions here, such as a refined measure of "communication," or of questions such as "who initiated activity?" The point is, and bears
repetition, that an effort has been made to distinguish relevant physical planning variables which can yield useable information from variables which are primarily social, economic or psychological. Experimentation with various sets of variables and diary forms would doubtless be necessary to test just how pertinent are the selected variables.

In fine, this study will (1) employ two methods of diary structuring--1 hour time intervals, on one form, and ½ hour time intervals (1 hour at night) in the other; (2) each of the alternate forms will collect concrete data to be compared and classified against a pre-categorised list* of activities--in the 1 hour diary type respondents will be requested to fill out activities that can not be included in any interval on a separate sheet, (dense areas of the diary can be investigated further, by small time intervals); (3) an extensive range of Activity/Time variables is to be used. The two diary forms will be compared for ease and efficiency of gathering data.

*The use of a pre-categorised comparative list of activities utilises the experience of other studies, Sorokin's and the International Time Budget study being the most comprehensive and applicable. Where activity descriptions do not fit these classifications a new and evolving activity form will likely be identified (and, hopefully, categorised). The process also provides for content analysis of activity descriptions so as to get at the social and psychological meaning of time expenditures.
One technique not mentioned so far, is that of asking the respondent in the presence of the interviewer to recall the activity of a previous day or days. Attendant to this approach are all the difficulties and fallibilities of memory distortion in recall. But it is a useful method for reducing the time and expense of interviewing, for the interviewer need not necessarily contact and visit the respondent before the diary day, nor put him to the trouble of keeping a diary. In large sample surveys it can be used by interviewers who knock on doors and request an interview, with only a minimum of prior introduction. For our purposes, time and money constraints preclude a large scale survey and data analysis, even though a "recall diary" could reduce efforts somewhat. Further, we can not accept the potential error of the recall diary, for our attempt is to get at certain specific and complete time-use conditions—the diary record will be applicable.

Very relevant to the recall diary technique is the question of how far back respondents can be expected to remember activities with any accuracy—and one day is experienced to be a practical limit; in regard to the structured diary record this question is cast as, "What is the length of time that people can be expected to keep up with such a painstaking and often embarassing task as recording activities every few hours." Without some inducement the limit is experienced to be one day at most,
if any accuracy is to be assured. And the problem of this data limitation raises problems of representativeness and generalisability to the weekly, monthly and yearly cycles.

The notion of behavior sampling can be used to suggest the way around such an apparent limitation: not only is it important to select individual respondents with reference to a desired population but also to choose a day as normal (or as atypical, depending on purposes) and as generalisable as possible—a weekday on a not too inclement winter's day, for example. Additional information is then gathered on activities not included on that day in an attempt to round off knowledge of what occurs, (how frequently etc.) to disturb or add to the normal routine of life. Strictly, one can generalise only to the variety of behaviors occurring on the normal sample day, but an attempt is made to expand generalisation by indicating at least what did not occur on that day and how unlikely or likely it is that it should not have occurred. Additional information by day of week (the week-end is obviously important) month and season is used in this rounding off process. Considerations of normalcy and changeability of time-use patterns is particularly relevant in studies of activities which may be especially pertinent to the rounding off process; leisure is an example.
The requirement to extend the span of time investigation by rounding off from only one diary day suggests the usefulness of techniques such as participant observation or other holistic research through free interviewing etc. They can be used to survey the whole range of activity in an integrated, processual fashion. Very briefly, the limitation of such approaches lies in their qualitative cast, their lack of a structure as rigorous as the survey/analytic approach, and the cursory manner in which they must necessarily compile data (to keep from total inundation). Such information would probably be more difficult to tie in to the quantitative factual approach with which our physical planning aims are linked: there has been very little research in this direction however and the above statements comparing techniques should by no means be regarded as conclusive.*

Further problems of operationalising Time/Activity Concepts lie in respondent co-operation, sampling, reliability and validity: we will deal with these briefly.

It appears that the objectives of maximum reliability, validity (and economy) which guide most methodological

* The author is at present engaged on studies investigating time use and Activity routines by holistic research approaches. Papers are to be presented on the topic to Professor Robert Weiss in May, 1968.
decisions are overwhelmingly governed in the study of
time utilisation by the difficulty of obtaining respon-
dent cooperation. Researchers report a high rate of
refusal to keep diaries, and a high rate of diary in-
completion after agreement to co-operate.

The rate of refusals requires that in a probability
sample in which subjects must meet certain requirements
(rather than be chosen haphazardly) one would likely have
to radically oversample potential respondents; if statis-
tical tests are to be applied to the data there will be a
trade-off between a large and expensive sample size
analysed by powerful techniques, and a smaller scale less-
vigorously analysed, sampling plan and data.

Other details of sampling decisions and procedural
research topics are well covered in reference texts, but
certain points are pertinent to time-use studies. Thus:
Sampling, by whatever procedure, will usually be chosen
with respect to some particular population of interest;
in time budget research there exists an opportunity to
sample across individuals, and or situations, and or
behaviors. Depending on interests and budget constraints,
there are many possible combinations of person or class
type together with particular behaviors (such as leisure
vs. work), in specific settings. This unique freedom
offered by a simple research tool has largely been neglected: emphasis has been either, (1) on obtaining voluminous information about a total of behaviors and situations, for some particular population group--constraint on population (the standard research limitation) has been recognised without acceptance that there could also be restraint on the behavior/setting realms of that population, which, far from being restrictive, could focus attention on limited and action relevant studies); or on (2) larger sample groups used in combination with a focus on specific sets of behaviors or situations--the study of leisure is example. Planning concentration on neighborhoods and community units has much to exploit in both these directions and in more specific, finely tailored and sensitive studies examining limited interactions of equal intensities of all three sets of variables.

Validity measures are of limited importance, for there is a fairly direct and logical connection between the conceptual notions of what is relevant subject matter, and the operational way in which one studies it. (There will be reason to believe that the data gathered is in fact measuring the conceptual notions of time.) Face validity measures are however appropriate, especially in light of any innovative research: we have employed this technique in utilising the lessons of Appendix I, a
literature search. Predictive validity had not been incor-
porated as a measure in any of the studies reviewed
prior to the formulation of this study: it offers a
useful tool easily applicable in repetitive or continuous
planning situations, but it would best be applied at a
fairly crude level of aggregation examining, say, only
one major division of public/private time. The aggre-
gation of activities should be chosen so as to reflect
some salient feature of the group studied.

Some studies use alternative recording techniques
(such as participant observation or consultation of
records) as checks on the time-budgets. One asked hus-
bands to check on wives (and vice versa). Generally
they affirm the validity of the diary: (they are costly
and not applicable here).

Reliability measures are of the most mundane kind.
Alternate-form techniques and split samples are, for
example, of little or no consequence, because the basic
subject matter of the research is (a) so directly relate-
able, and (b) so personal to each respondent--there is no
right and wrong. Pre-tests of the diary instrument are,
however, essential, especially if the activity routine is
to be supplemented by additional questions (on Motivation
and Value, for example). The different forms already
suggested for this study are to be compared for efficiency
not for reliability.
The reliability tests employed are measures such as uniformity of interview administration, and elimination of falsification by checking information in several different ways; these are well enough known and agreed not to require enumeration. One research aim is commonly to remove or control or measure the effect of a variable such as 'different personal situations' so that it will be known that the data obtained does not result from, say, happiness of some individuals and depression of others: in behavior or situation sampling as well as in individual sampling, of which the above is example, the same type of precautions must be taken. The possible unrepresentativeness of the diary day must be checked.

In this part (A) of the Test Case we can include some of the problems of interpreting Time Budget data. At first sight such problems are not obviously related to the subject matter of concern at this point, i.e. translation from conceptual to operational levels; none the less, such problems of interpretation have been found (in previous research) to offer useful lessons for the manner of 'operationalising.'

Categorisation is paramount: "if," writes Foote, "all the activities were treated alike, the proportion of time devoted to activity would be exactly 100 percent in
all cases. When certain authors group all leisure activities into less than ten categories, the surprise they express over the remarkable similarity and stability\(^3\) of the data for all kinds of persons seems gratuitous. All forms of categorisation (either prior to the diary or following concrete data reporting), must include a range of activities sufficient to embrace most types of overt activity without "exclusion of any of their essential qualities." (In the region of 30 major activities seem to be required.)

Problems of categorisation of activities aside, it is useful to bear in mind the limitations of the factual data which is to be processed. First, activities are not necessarily the most important aspects of life; beliefs, ideals, ideas, prejudices and so forth transcend activities to some extent; this comment is made as reminder only of the boundedness of a behavioral approach (concentrating on overt activities) to human phenomena, no matter how all inclusive it may appear. Second, the importance of activities are not necessarily reflected by their time use: we try to overcome this by the inclusion of Motivation and Value (or preference) measures, and an Output (related to satisfaction) measure. But still, this is at a fairly gross level; it does not reflect how, for example, activities might be satisfactory because they are scheduled in a particular order, rather than because they include preferred modes of
action. (We can only invoke the criterion of planning relevance (or ability) as escape or excuse for not attending to these matters.)

In the measurement of change, direct revisions of the time budget between one time period and the next require some care in interpretation. We have already noted the functional equivalent case, whereby it may not be so important that time spent on, say, television now uses up time formerly spent on equivalent media (such as reading), as that it also uses up time formerly spent at work, sleeping or in family conversation. This is especially true in the extent to which the content of television replicates that of the substituted media; if it is equal in content and if the activity includes time taken from other nonequivalent activities, then total content would be increased. On the other hand there is undoubtedly justification for saying that the content of many activities has undergone profound change even though the time spent upon them remains unchanged. It is toward the understanding of such paradoxes* that the notions of Motivation, Value and Communication measurement, along with an Output measure

*De Grazia makes much of the dupe of the longer week-end and more leisure time. He shows that leisure time given with one hand, is taken away by the other which invents gadgets and equipment etc., necessary to the enjoyment of that leisure, which in turn requires more work; a vicious circle. We end up sleeping less than before.
are directed. They would attempt to reflect real measures of change.

(B) Principles Governing Formulation of the Operational Measure: The operational measure is designed for employed persons and students (see notes on sample below). It is in 3 parts, a Pre-diary Interview, the Diary, and a Post-diary Interview.

The Pre-diary Interview identifies the respondent and seeks information about the general structure of his time use. The aim is to obtain a picture of the 'normal' time use of the respondent as a guide to the normality (or otherwise) of the Diary day: the Diary day is a mid-week day and should, by all counts, be a normal and reasonably representative one. This general information on normal temporal structure will help to delimit the permissible boundaries of generalisation from the Diary data; i.e., just how representative is it, within weekly and monthly and seasonal constraints.

Included in the Pre-diary interview is a series of questions concerning (typically) irregular and/or infrequent activities, such as movie going or outdoor recreation; the activities are none the less important for their singularity and rounding-off properties. Information from these questions is also designed to amplify later Diary data, in an attempt to define the broader cycles of
time use as supplement to the normality of activity and time routines. It is included at this stage as both introduction to the methodology of the Diary--for the questions asked of each activity are similar to those in the Diary--and as an important information report which can again be questioned at the later interview if Diary information suggests it to be either false, or incomplete. (The diary of any one respondent might, for example, suggest activities omitted from this previously gathered general schedule.)

The Diary covers the 24 hours from 12 midnight to 12 midnight on a weekday. It is a matrix plotting activities in specific time intervals (the rows) against, Place of occurrence, Contact characteristics, Communication characteristics, and activity Motivations. (Instructions are included (with the diary) for its completion: data is concrete as regards activity, place and Motivation description, but for ease of recording, it is precategorised for Contact and Communication.) Two forms using different time intervals are compared for recording efficiency.

The Post-diary Interview is first designed to examine the normalcy of the Diary day, in terms of weather, personal disposition of the respondent, and so forth. It then attempts to suggest omissions to the Diary which the respondent might have made, as a jog to memory and as a prompt to any necessary or useful elaboration. These lines of enquiry are followed by tests of activity Preference
and Value; more personal data, on car ownership for example, completes the interview.

All of the questionnaires and Diary follow fairly directly from the aims and interests outlined in the text. However, the measure of Value and activity Preference is one aspect which probably deserves brief comment and explanation.

The Value study is a compromise of Chapin's questionnaire which requires extension of the respondent's activity routine, in respect of the way in which he would use extra hours of free time, and an elaboration of Foote's notion of preference, in which reported daily activities were ranked in importance (see page 72). The Foote study is extended and modified by asking what activities during the diary day would be given up to accommodate an unexpected but important activity. By inference, the activities renounced will be those of lesser importance and value; we should recognise, however, that activities of high value may be renounced in the test situation simply because they are regular and can be foregone because of either desire for a change or because of the ability to 'make up' the time lost in further instances of that regular activity. The Value data is generalisable to the days of which the diary day is sample.

Chapin's study is pruned; respondents are asked, in an open ended fashion (concrete data), what they would do
with certain amounts of extra free-time, by day, week and month. In line with previous comments on the restrictions of pre-categorisation, Chapin's pre-categorisation of permissible activities is rejected. Data here is generalisable to all time/activity because it is aimed at general preferences for activity beyond the constraints of any specific day or period.

(C) The Selected Respondents and the General Character of Administration of the Operational Tool in the Test Case.

The respondents (or sample) all live in a large apartment building in Cambridge. The spatial concentration has no immediate value in the pre-test except perhaps, that urban realms can be traced with respect to one point. But if we are to draw conclusion from the pre-test data, as well as judge the efficiency of its formulation, spatial concentration can be useful as a constraint, making data comparable to a planning situation with an 'area' of concentration.

Spatial concentration is, in this case, concomitant with homogeneity or concentration by type. A number of representatives of the same 'class' provide much more dense and informative and indicative data in this limited situation, than would disparate data from a number of class types. But the 'test' as such of the diary and
questionnaire form is restricted by this effort to draw more telling conclusion—it was not tested on other types (and situations).

The respondents are all single, male and female, students and employed persons, all in their 20's.

The apartments are all similar, they are on four floors.

The diary day was a Wednesday in April (1968).

(The population of generalisability is probably student and employed persons of age 20-30, living in apartment buildings in locations similar to that of the Cambridge area. The diary data is probably representative of week days in the months of November through April or May. In fact these constraints of generalisation are not of much interest for concern is with how the test worked rather than what it shows in the way of data. But their stringency is evidence, somewhat, of the restrictiveness of the time-budget form—a restrictiveness which has been the bain of sociologists aiming at general theory but which need not hinder the planner focusing on specific problems amenable to particularistic research instruments.)

(D) Evaluation. Evaluation is here interpreted as an appraisal of the efficiency with which the research instrument can be applied; (the Summary and Implications for Planning, see below, can be viewed as a study of
effectiveness of the instrument in terms of its data contributions and the suggestion and pertinency of that data to planning action).

In general, the instrument (diary + interviews) appears to be none too onerous and time consuming, though it should be cautioned that the Test Case employed only the Input half of the Input/Output activity scheme developed in Sections 2 and 3. Respondents were cooperative, they said that they found it quite a simple matter to keep the diary during the 24 hour period, and that having learnt the structure of the diary they felt that a longer period of 3 or 4 days could be recorded without imposition on their time and assistance. They also expressed interest in the time/activity description of their day, often making remarks such as "I didn't realize I did so many things," or, more usually, "It looks dull doesn't it."; there was fascination with being, in a sense, observer to one's own action and yet of being objective in that role. The data, because it was one's own and because it was at the same time recorded by oneself as an independent agent, became instructive and spoke of lessons in a 'therapeutic' sense--such as, "You'd better brighten up your day"--that was probably more forceful than would have been an outside categorisation of one's activities as 'dull and requiring planning action' to 'enrich and diversify' activity experiences. (We will take up this point again.)
The co-operation and intelligence of comment on 'one's own data' can in large part be ascribed to the type of respondent in terms of education, skills and sensitivity to both the subject of enquiry and the worth of making such survey studies. Initial cooperation and the ability to draw conclusion from the exercise upon completion, would be much different if the instrument was applied in, say, the Model Cities area of Roxbury; but the experience of this test case suggests that once undertaken the completion of the diary can be expected to be a simple unimposing task. This simplicity and ease of completion arises partly from the diary structure and partly from the division of time into generous intervals of 1 hour and \( \frac{1}{2} \) hour to be summarized by entries at several times during the day; there arises the question that we might be substituting simplicity for superficiality of data.

It is argued that this is not so, that far from being but crude coarse-grained generalisations of activity routines, the data supplied is in fact at the level of aggregation and concentration that is specifically relevant to most general planning concerns; quite easily (see page107) one can pick up the activity pattern of the 'normal' day in terms of the nature of the activity, its Place and Contact and Motivation aspects. Time interval divisions of say, \( \frac{1}{4} \) hour or 10 minutes could certainly reflect more specific information such as that about small
scale location changes within the Home or Work place, and might pick up nuances of Motivation and amplify Contact characteristics. But it is questionable that this specific additional information, though interesting, could really be suggestive of intervention action unless it was especially oriented toward single families and homes.

Diaries using ¼ hour intervals which were kept by the author and a friend provided information of relevance to architectural concerns and the study of behavior and the sociology of small space use, but the data would be cumbersome to broader concerns and to an interest in the comparison of varieties of actors: the nature of the instrument is such, however, that it finds applicability to all levels of concern, and it could be readily used in its present basic structure for both exploratory studies at a general level and for more detailed concentration on areas which exploration shows to be salient.

 Practically, the 1 hour diary form and ½ hour form show little difference in terms of the volume and accuracy of data supplied, (and there was no respondent complaint or apparent inconvenience in terms of the more complicated ¼ hour form). The experience with the ¼ hour form and the Test Case forms indicates that the amount of activity information (by time interval) decreases exponentially--it is high (and differentiated) for shorter intervals but becomes quickly reduced (and remains at approximately the
same level) for increasing time intervals. ½ hour intervals could therefore be recommended for their slight

\[ \text{Volume and yield of concrete activity descriptions} \]

\[ \text{Length of Diary time intervals} \]

benefit in gathering extra information, (though they may become repetitious if activities do not change in type very often and though the 1 hour interval often includes as much information as would be included in two ½ hour intervals), and for their psychological impact in suggesting to the respondent that the diary is not a slipshod superficial one requiring only summary responses.

The time interval of the diary divisions appears to interact with the manner in which data is reported, not just in how much is reported. Thus the diary gathered concrete data in the hope that the comments of respondents would be useful insights into the kinds of activities that are special to the group, but in fact the concrete description of activities in a ½ hour or 1 hour interval is so general as to tally almost exactly with the pre-classified categories to which, it was thought, they would have to be carefully assigned. It is more likely
to be in the more detailed description of activities (over smaller intervals) that new and indicative emphases will be reflected. There will be many obvious and necessary exceptions to this rule, such as the emergence of a new sport that would be reported in both long interval and short interval diaries, but it is possible that pre-categorisation can be employed without much loss of information and content in instances using $\frac{1}{2}$ hour and 1 hour interval divisions and with little interest in major comparative study of different groups or the measurement of change over time, (in which cases concrete data are valuable indexes of difference). But it must be emphasised that (as noted) categorised data forecloses the possibility of immediately being sensitive to aspects of activity undergoing change in type and in value affections.

Again in terms of practicality, it would seem to be easier for a respondent to simply write down what he is doing rather than make reference to and select from a list of up to 30 (or more) code numbers set against pre-categorised activities: concrete data which is any case easy to categorise because of its being a general summary of $\frac{1}{2}$ hour activity intervals may also be the most efficient respondent recording method. (Over a period of several days this advantage would lessen in comparison to a respondent who became accustomed to code reference.)
The type of respondent used in the Test may well have biased the degree to which concrete data reports were found to be easily classifiable and therefore have unduly suggested the above conclusions about its use. Thus, the long time intervals used in the diary may only have suggested summary reports to the respondents because they were capable of formulating such reports. Rather than using skill and intelligence to amplify and enrich their activity descriptions they were used to condense them; and activity descriptions were condensed in ways that were very similar among all respondents. The above comments on the ease of concrete data use and of responses to differing time intervals would require to be checked over different respondent types.

With regard to the remainder of the diary form, there was agreement among respondents as to its clarity and directness. The use of code numbers for Contact (and Communication) was appreciated, and would be even more applicable over time periods of 3 or 4 days. One disadvantage of this coding is that there is no indication of any repeated number being in reference to the same person—does, for example, the respondent engage in different activities in different places with the same or different girl friends. Often this distinction will be obvious from the situational change or constancy which surrounds the activity, but if it is not and is felt to be of particular importance, changes in Contact with the same type of person
could be indicated by subscripts to the repeated code numbers. (This technique can also be applied to Communication and to the general questions about activities administered in the Pre-diary interview--see page163)

The Pre-diary and Post-diary interviews providing supplementary information to the diary sample, was much quicker and easier to administer than its length suggested--it could be expanded--which is indication that the full Input/Output scheme may not be too adventuresome.

Some difficulties of methodology of these interviews were: (1) that in formulating the interview for students an attempt had been made at a typology of general ways in which time might be spent--regularly, irregularly but with predictable periodicities, irregular but unpredictable--so that each type could be questioned specifically and with relevance to his particular activity routine. It proved difficult to categorise respondents in line with this typology, there were protests that "I change between all three types depending on my work;" yet respondents could not say just how they moved between types so that they might be allotted to a fourth category of 'regular change between types.' Further questioning, not recorded on the diaries, attempted to typify by establishing the dominant mode of activity expenditure but this somewhat distorts the richness of reality. The lesson to be drawn is the need for a more open ended, non categorised question form: increasingly, flexible job situations will probably make this freer
interview approach necessary for many respondents other than students and those who we typically think of as living unstructured existences.

(2) The same difficulty arose in asking all respondents for information about activities which are not usually reflected in a single day's diary--activities which occur on a less frequent basis than a day to day routine but are yet very necessary to making that daily routine acceptable. A list of probable activities (see page 163) had been prepared under general categories; but respondents so often said that, for example, "Oh! I don't do anything like that but I do do this," (and 'this' turned out to be an activity related to the category but interestingly additive to it), that the question was administered as "do you do anything like this." Additional activities (not listed on the questionnaire) mentioned by the respondent were then noted on the form.

Finally, (3) the administration of the study of Value in the Post-diary interview required some explication of the questions on the interview form. Essentially these questions are (a) if you had to do something unexpected on the diary day what activity would you forego, and (b) if you had extra free time what would you do? In most cases it was necessary to add (in answer to queries by the respondent) that in (a) the unexpected event is just very important but non-remunerative in terms of valuable
experience or monetary gain, and that in (b) the extra free time would be used in circumstances (of job and money constraints) not too dissimilar to those of the present.

In organising large scale application of the research instrument attention must be paid to further research issues specifically pertinent to the larger aggregate situation. Test of the instrument across different respondent types and classes, in different situations will be necessary: we have already observed how conclusions about diary reformulation may be biased in this Test Case by respondent aptitude. Fundamental to the research of certain groups will be the need for increased measures and checks of validity: reliability measures, with particular reference to uniformity of administration of (as suggested) an open-ended interview form, will be relevant.

(E) Summary and Implications for Planning.

This part of Section 4 attempts to summarise the data of the Test Case, and then to draw conclusions (from the summary) which have planning implications and usefulness. In both summary and conclusion the intent is not to use Test Case data as comprehensive reliable information which will, on the one hand, require extensive explanation of summary methodology or which will, on the other hand, generate or prove hypotheses and concepts. The data, which is obviously scanty, is to be used only to suggest modes of analysis and notions for planning. The point is not that
remarks be perfectly correct, proved and validated by data, but that they derive from it (and prior knowledge) as ideas which can be useful to further study that can undertake more rigorous tests and more thorough analysis. These ideas will be treated in general terms, in the belief that presentation of a range of possibilities rather than the specific elaboration of a few (which would in any case have little data background) is most appropriate at this stage.

Summary: The way in which data is summarised is difficult to dissociate from the purpose of its collection and the action to which it is felt to be appropriate. Physical planning concerns will thus be interested by aspects of the data which might be seen as less relevant to social planning concepts and interests: that is, there will be different emphasis on some of the aspects of activity which are embraced by the comprehensive Input/Output scheme defined in Section 2. Nevertheless, there would appear to be certain common summary requirements irrespective of particular emphasis. The following are suggested.

(1) A simple reference to the kinds of activities occurring by time during the day (or time spent)—a summary of the activity description column (which extends over 4 pages) of the diary.

(2) A method for structuring this listing of time against activity so as to reflect and emphasise the changing Inputs to Activities, by time of day——a
hierarchy or weighted or ranked graph of activities by time of day so as to describe a diurnal 'configuration.'

(3) A simple reference to the kinds of Place, Contact, Communication and Motivation occurring by time of day; leading to sub-heirarchies (i.e., secondary to the Activity/Time hierarchies) in which these activity aspects are weighted or ranked so as to emphasise their diurnal change.

(4) Cross reference of activity (or time of day or time spent) against Place, Contact, Communication and Motivation, in as much detail (and profusion of cross tabulation) as is required by any special interests. In making such cross references, the supplementary information about less frequent activities gathered in the Pre-diary interview can be utilised so as to show changes in activity rate (and perhaps intensity) with respect to, Place Contact etc. Thus, the mapping of a respondent's urban realm of interaction (all the Places he goes in the metropolis) could be differentiated by varying degrees of frequency of interaction in different urban areas.

(5) Cross tabulation of time (amount of time and time of day) spent on grossly aggregated (5 or 6) categories of Activity or (2 or 3 categories) of Contact, Communication, and Motivation. This would be for ease of reference and examination: we have already
cautioned against the increasing tendency for all persons and groups to appear as similar in their time expenditure as the number of categories of expenditure is reduced.

(6) In this Test Case, a near saturation sample was taken of one apartment building. We are in a position to fulfill the requirements of the Descriptive Aspects ((1) through (5)) of activity Inputs, which require a total census of actors or setting rather than a sample survey of either. See page 63.

Requirement (1) can be met by the process of categorisation of concretely reported activities. The list of categories—see below—of activities used for this study comprises 23 divisions; 5 fewer than the International Time Budget Study, and only half the number used by Sorokin. The fewer categories can be attributed to the unelaborate summary nature of respondent reports in the large diary intervals of time division, and to a respondent type which appears (a) to have interests very similar to every one else in that class and (b) to be constrained in or excluded from many of the various activities reported in other studies, by virtue of his work situation or home setting (with, for example, no wife and children and with no access to a garden).

Requirement (2) can be met by ordering the activity category list and plotting the activities, by time of day
against it. The diagram on the following page shows how this plot can be graphically represented so as to show configuration: the ordering of activity categories is achieved by a simple weighting system which emphasises requirements for concentration or concerted action and Contact characteristics of the activity. (The weighting is in no way an absolute—the system can be made according to any set of specific criteria as long as they are consistent.)

The weighted list of 23 activity categories is:

1) Sleep
2) Resting
3) Reading
4) Personal Care
5) Eating (at Home) or in a quiet place. (If not either, then Eating is 14 or 15.)
6) Listening to Radio, Records, etc.
7) Television Watching
8) Food Preparation (other than quick preparation of light meals).
9) Laundry, Mending, etc.
10) Other upkeep and leisure and Work around House
11) House Cleaning
12) Child Care
13) Education (classes, seminars, browsing, but not serious study).
Arrow connections apply where activities could not occur without the contribution of the previous activity.

DIARY DAY TIME/ACTIVITY DISTRIBUTIONS (for each respondent).
14) Social Conversation (telephone and face to face).
15) More Structured Social Events (such as interviews).
16) Shopping and Non-work Trips
17) Trip to and from work
18) Visiting Night Clubs, Bars, Parties, Concerts, etc.
19) Other Leisures and amusements requiring active commitment
20) Regular Work, (study periods for students and job, for employed persons).
21) Activity in Organisations and Clubs
22) Sports events, trips, etc.
23) Exceptional Events.

(Some of the activities on the list were not recorded in the diaries. They were, however, mentioned by the respondents and are included so as to make this a complete list for this respondent type.)

Requirement (3) (separate activity aspects by time of day), can be easily tabulated. Using the numbered lists of Contact and Communication, for example, sub-hierarchies could readily be described (see below).
Requirement (4) is straightforward. An example—diagram 2—is given of generalised activity type plotted, on a map, against place. In this example the added information of the interviews is used to record activity rate as an extra integral dimension.

Requirement (5) is again a simple matter of cross tabulation. (The large categories of activity in this gross aggregation might simply be, Societal, Economic, Personal etc., or might be constituted so as to suggest other attributes such as, Pleasurable Activities, Force of Circumstances, Distasteful Activities, etc.)

Diagram 3 suggests how the Descriptive aspects of activity (Requirement 6) can be graphically recorded. (The methodology was introduced in Section 2, page 47.)

These are some general possibilities for summary. Emphasis has been given to visual methods of summary and to configuration and tabulation by time or day rather than by time spent. There is equal possibility in mathematical and statistical representation and in the abstraction of the data from the chronological structure of the diary record.

F. Implications for Planning: it is by no means obvious just how research should contribute to and determine action. It is to some extent an open question as to how this research, guided by theoretical notions of activity relevance
(Respondent: Sherman)

Cambridge home base

boston

NORTH

(Respondent: Gerstien)

boundary of major areas of city interaction

boston

(Respondent: Tanner)

Townships

NORTH

HOME BASE

LEVELS OF DISPERSION

FOR SOME TYPICAL RESPONDENTS

MOST FREQUENTLY USED AREAS

NEXT MOST FREQUENTLY USED

LEAST USED

BOUNDARY OF MAJOR AREAS OF CITY INTERACTION
A boundary, based on affinity, which denotes insularity. Each diagram is a vertical cross-section through the 4 storey apt. building.

Focality is shown in 2 hour intervals.

Focality is the daily time of activity occurrence.
Affinity is similarity between these kinds of activities.
Insularity is the maintenance of affinity.

Patterns of affinity and insularity (common kinds of activity) and of focality (or common daily times of activity).
and tested as a detail investigation of a comprehensive spectrum of activity aspects, would be used as evidence of the need for certain specific interventions. This is so because there exist various modes; of research, (variety being maintained even though researches are carried out with similar theoretical intent and operational methodology); of ways of presenting research; of planning bureaucracies and organizations within which research is transformed to action; and of planning processes (and terms of references) by which action is applied. These groups of modes interact in intricate fashion, but it is useful to elaborate and characterise each separately and to draw only the main connections between them.

Of the group of research modes, the counterposing of the Holistic and Analytic modes provides the main (and most direct) opportunity for consistent demarcation. The Holistic mode is concerned with relationships within systems of variables acting as 'wholes' or constellations or unique configurations, or with functional models descriptive of the working of a totally described situation. The Analytic style describes numbers of variables in terms of their lawful and processual connections, and thus concentrates on intersections of variables in which one concerns the next without immediately effecting all others--it does so only processually. Thus the systematic conceptualisation will emphasise interdependency in which a variable is
not an analytic link in a chain that can be isolated, thereby causing the chain to lose only part of its length, but in which any variable is somehow linked to every other so that the removal of one variable disintegrates the concept and existence of the whole.

An Holistic description, being complex and closely interwoven, tends to seek manageable system boundaries which delimit variable interaction: by definition, a system requires boundaries. An Analytic style allows for eclecticism in the selection of variables--they may be taken from a number of systems. Research aims to explain (1) how a system maintains itself by acting so as to fulfill its goals, (which in turn help to define its existence as a system), or (2) how Analytically defined variables act mechanistically to produce a known result to a given stimulus, in a given environment, (which is somewhat analogous to the boundary notion of the system approach).

Related to these research modes are two parallel approaches to concept or theory generation and verification. Again in describing these approaches we must, for simplicity, deal with a pure statement of their extreme positions; as with the research modes described there are many commonalities.

The first approach is the Logico-Deductive one in which theory and hypotheses (derived by logic and prior knowledge) are stated as clearly as possible and are tested as
stringently as is tolerable. The alternative, substantive or grounded theory, is to collect data with only a general area of investigation in mind, and to examine data concerning this area to 'see what it shows.' This approach is advocated as necessary because there exists insufficient theory of any fundamental importance which can be tested by the Logico-Deductive analytic methodology, and because, being divorced from natural data sources that method is a poor generator of new theory and concept.

The formulation of precisely deduced statements precisely tested, favors the Analytic approach in which the problem can be expressly stated, and in which complexities of interacting effects tend to be minimised—though multivariate techniques and tree models are clearly coming close to full system capability. The substantive approach will require data that is as rich as possible; it is preferable to gather data that is suggestive and illuminating though perhaps not gathered with respect to strict measures of, say, validity—such aspects are better left to the later test processes to which the theorising process is prior. And this rich data is best developed by dense Holistic study methods, such as the use of free interviews and participant observation. However, as Glaser and Strauss make clear, there are no limits to the techniques of data collection, emphasis is primarily on its accumulation and not its methodology; but the more analytic data (from surveys, for example) is used in the substantive approach the more the
resulting theory or construct of typologies will be limited to descriptions of simple variable intersections and correlations that are much less vivid than the 'picture' or constellation effect of the total statements that might be available Holistically. (The Analytic approach might show for example, that children from low income families and with low education level tended to become delinquent, whereas the Holistic one will easily—and cheaply—explain the full picture of interaction of these variables and describe each in complete and real terms.)

The point of this digression is that the data resulting from application of the Operational scheme and associated research instruments which have been the subject of this study, is applicable to both research modes. The notions and operational tools presented here are at once general in nature, having been formulated only with a view as to what variables are relevant and not how they interact. It cuts across research boundaries: thus Reiss used the Time Budget instrument analytically in order to refute the notion of depersonalisation of individual contact in urban life; and the International Time Budget study used it (almost) Holistically to compare cross-national 'pictures' of the conditions of urban industrial cities. We can expect the use of our proposed methodology to be relevant to situations suggesting the use of either the Analytic or Holistic mode.
be one of feeling out the planning situation by initial probes (small scale actions), and of observing how these actions are accepted or rejected, so that sensitive areas of the system can be established and more effectively handled in later action. This approach is somewhat unfamiliar to that which sees problem solving (in 'urban crisis' situations) as the expenditure of massive effort in short run programs.

We have discussed how the methodology here presented could be useful Holistically, and how it could also be developed gradually so as to concentrate on increasingly detailed or focused aspects of behavior and activity. In fact the potentially complete and graphic nature of its data would seem to encourage the understanding of given situations at various levels of interest, in a sequence of effort.

Unfortunately the Holistic method of data presentation and the kind of data which it includes (i.e., the second group of modes identified above) can tend toward the impressionistic. In theory or typology generation its method is to concentrate on only a few representatives of certain features or properties in the population rather than on a strictly selected sample which guarantees generalisability. It examines these representatives with any technique that is available and formulates loose, though sensitive and insightful, statements about them, which are much different from the factual proven statements of the
Analytic process. The Holistic depends on impact and on the presentation of a picture not previously observed or comprehended by Analytic research, or indeed by public and academic interest—Michael Harrington's, *The Other America* is such a statement. The Holistic therefore has uses for advocacy and persuasion that is of a type very different from hard but sometimes uningratiating percentages and statistical significances: we can expect planning offices to increasingly use this mode as planning problems come more to require local initiative (as in Model Cities) rather than full Federal direction, but still require some local justification for Federally granted resource expenditures.

Again, the methodology presented here is pertinent to this form of derivation of planning action. It has advantage in providing rich data, useful to advocacy, which is yet well structured and open to few criticisms of impressionism or of superficiality.

The third group of modes which we introduced—the nature of organisations and bureaucracies which transform research into actions—can be divided into two modes; to be characterised as those which work and plan with people, and those which plan for people. Practically it is difficult to dissociate these modes from the fourth group of modes—the processes through which action is applied—by which we refer to the nature of goals, their time horizon, their sequence of realisation and so forth. At risk of over-simplification we can surmise that as the time horizon of
goals and/or the complexity of directions towards their realisation increases, so the active participation and interaction of the people for whom planning is intended, will tend to lessen. Their political assent will no less be necessary--it is just that for certain areas their interaction must be reduced for reasons of practicality and efficiency. Where issues center around behavior or the need for immediate resolution of problems, with less respect to things and properties and efficiency of resource allocations, interaction between planner, planning and the 'public interest' will be marked. Taking the instances of Model Cities planning and of Land Use model building as extremes of, on the one hand, immediate associative (people and planners) action, and on the other hand, of predictive future oriented dissociative action (which none the less relies on sensitive data inputs), we can trace the applicability of the Time/Activity methodology to these widely differing situations.

Of the Model Cities issue, we can suggest the Time/Activity methodology to be useful in a survey approach to environmental behavior, focusing on particular groups, behaviors or situations (as required). One of the program's objectives is to co-ordinate the numerous organisations in a demonstration area into some effectively functioning unit; examining organisational activity along an Input/Output measure would be most illuminating, especially
in comparison to Input/Output activity data on individuals making use of organisation services. Attempt would be made to sort out areas of hardship and abnormality and inconvenience (and perhaps pathology) by the application of some set of acceptable normative standards to the data, or more preferably by comparison across sample groups in which one or more can be taken as a control group of reasonable standard.

In the rapport with the community it will be possible to build up a repertoire of the most vehemently voiced needs and malfunctions, that can be compared to and understood with reference to their respective activity routines, which will express unsatisfactory Output conditions. This would begin to match the behavior to the complaint.

If we take the Test Case data as example, and apply normative criteria, there would be reason to comment on, the insularity of the respondents—they are all geographically 'ghettoised' within the Downtown Boston, M.I.T., Harvard and Charles River areas; or on the lack of association between respondents living in the same apartment—no one apparently visits with anyone else in the building; or on the type of their leisure pursuits—though varied they are all of much the same nature and tend, simply, to reinforce the respondent's educational focus; or on their reliance on one or a few contact forms, with few pure client relationships with the general public and a high
repetition of each mode(s) of contact with the same person(s). The instructive and inclusive data can point to both the individual as unit of concern, or to his interaction with others, or to his environmental interactions and use of services.

One point that should be emphasised in the process of working with individuals is the potentially 'therapeutic' value of much of the proposed methodology, especially the keeping of the time-budget. Going on the theory of therapy, it may be as much the lesson learnt from the process of supplying data (in terms of the personalised diary keeping record) as it is that of hearing answers given by the authorities to whom data (and other representation) is supplied. In this direction the Time/Activity concentration would appear to be particularly applicable, and adaptable, especially in more loosely structured forms of the proposed scheme: there might be attempts at 'instantaneous therapy' whereby the interviewer is also a social worker, and is able to confront respondents with the immediate experience and lesson of diary formulation. At present all this is notional!

In the longer scale of planning which tends to concern itself with broader problem areas, the inclusion of activity information can best be justified on the theoretical and conceptual grounds which Section 2 discussed. That is, that location choices are increasingly governed by the ability of a location to satisfy certain activity demands which
are both known, in terms of past experience, and felt, in terms of hoped for new experiences. Model theories of location motivation require to add some index of this revision which cuts across so many of the proxies and constants now employed; they must deal with items much more comprehensive than, say, time/cost of travel to work, and must deal with them in detail manner—not just as a lumped miscellaneous item.

As people begin to revise the conditions of their location choice, there would seem to be forces, in the form of increased informational supply about a burgeoning number of location possibilities, which make it somewhat more difficult for the individual to make a choice. Marginal differentiation amongst this increasing range of choices would seem to be more and more determined by their sensitivity to activity routines, if, as is likely, the choices offered are more and more difficult to distinguish as to, say, accessibility to jobs and shopping, or to status. Thus, not only will models be inaccurate if they omit the activity variable, but their inaccuracies will appear to be capricious and unreasonable ones. (The nature of any metropolitan area in terms of hetergeneity and homogeneity of location/environmental conditions will of course interact with the need for detail in activity study; we would assume that in distinctly different areas decisions would be made along
distinctly different and observable lines of activity priority.

Having presented the case for the inclusion of routines in models, the author must admit to only a limited understanding of just how it may be done. With Chapin as guide, it would seem that so far there has been little success in applying the data to predictive model situations. We can record that Hemmens has suggested a model using a transitional probability approach and involving the use of a semi-Markov model in the simulation of choice and spatial distribution of activities, and that Hightower has proposed an adaptation of the population potential model to get at choice of activity and its location. But these represent only some first thoughts and we can reasonably expect more sophisticated studies to be developed, especially under Chapin's direction at North Carolina.

Some general problems which initial studies have pointed up are, what levels of aggregation should be used in respect of activity classification, in time, and in selected populations. A routine may emerge or be wiped out as a measurable phenomenon simply by virtue of the level of aggregation chosen in each way of aggregating data. The question arises of there being a priori bases for making decisions on aggregation that would be appropriate to these problems. Or, an even more elusive issue is the problem of operationalising the attitudinal nature of the Output investigation which our methodology proposes: at
the back of this problem is the implicit assumption that to some extent value systems should and can be taken into account in modeling systems. But how are they to be brought into unidimensional space and what forms of output from these behavioral systems are required to insure compatibility with land use modeling systems. The overall problem is an extremely complex one; if solved it is argued that results will be extremely rewarding ones. The attempt that has been made here is to point to and organise some of its many facets.

One final application of the Time/Activity scheme and methodology which should be mentioned is its potential usefulness in experimental forms of research. It is easily reproduced, with only a limited possibility of sensitising the respondent to its form and required content. To take a natural experiment situation as example, the activity routines of residents before and after relocation from an urban renewal area, could be directly studied with the direct application of the research instrument to both situations, with very good assurance that the after conditions could only have resulted from the experimental variable--though the after condition of routines will alter over time as the variable effects are accommodated. The point is that unless some process such as therapy, as previously suggested, has been applied, the respondents ability to report his day's activities on a
diary day will remain much the same; only if he has been oversensitised, (by therapy for example), will there be a tendency to eliminate or falsely report data. The possibility of following the full effects of changes in activity routines may be one answer to the evaluation of programs which when judged by their own goals of, say, using urban renewal to increase the flexibility and productivity of urban land uses, would appear to be all too eminently successful (in a biased fashion).

This is a review of some of the most effective points of application of the ideas and techniques which this study has suggested. In identifying these points there has been an implicit assumption and understanding of certain interdisciplinary interactions resulting from both a common interest in urban planning situations, and from an increasing mutuality in respect to just which aspects of the environment and its behaviors are to be held as relevant, essential issues. So, with regard to the latter of these two stimuli to interaction, psychiatry and therapy can, for example, be included as contributory planning disciplines precisely because they are moving as disciplines from the study of, say, the unconscious and the influence of past personal history on present behavior, to a realisation that the individual is not necessarily honored by emphasising
his separation from the surrounding world, and its overt activities. There exists an encouraging confluence of theoretical and operational concentrations which is quite separate from the common ground established by the need to counteract commonly felt urban crises. It is suggested that the concerns—theoretical and operational—of this study are, at once, made to seem realistic by this confluence, while being formulated so as to complement and encourage it.
APPENDIX I:

HISTORY OF (A) THE USE OF TIME-BUDGETS, AND OF (B) OTHER ASPECTS OF TIME IN THE EXPLANATION OF ACTIVITY
APPENDIX I: History of (A) the Use of Time-Budgets, and of (B) Other Aspects of Time in the Explanation of Activity.

Part A: Time Budgets and Activity.

In previously identifying the analogous relationship between money and time expenditure, and the way in which its perception influenced the type of data which became relevant to research we defined, implicitly, a major stage or step in the study of human behavior and activity.....

Leplay's famous 19th century study used family financial budgets as a basis for the comparative study of the working classes in Europe. Engel and his critics soon developed a dynamic (configuration and interplay) approach to such budgets and in so doing made the necessary (but by no means obvious) connection of money expenditures with the time balance sheet of activities. In earlier work the process of budgeting was a method for behavior research. In the new interpretation the family budget no longer represented an economic situation but, in a certain sense, a report of economic activities from which conclusions could be drawn regarding the behavior pattern and (partly) motivation behind the activity.¹

The following traces the development of the dynamic approach, which by the early 20th century was well established as an analytic technique. It then focuses on the time-related studies of the past fifty years as they are
expanded (or, rather, used with other research instruments) to elicit qualifying data.

We are to look, in this specific focus, at how successful has been the marriage of the time and activity variable. We will not be interested in the technicalities of the procedures by which the variables are related but only in the number of aspects of activity which can be explained by time. (We might have selected an alternative series of studies to historically examine the aspects of time explained by the study of activity.)

Throughout the history four developing traits will be identified.

1) An interest in dynamic interpretation leading to analysis of configuration, rules and processes of change, see above.

2) A progressive inclusion of aspects of activity, or, in more structural terms,

3) A changing emphasis on the importance and relevance of activity aspects, beginning with inputs, then description and outputs.

4) An increasing use of the time dimension as an explanation of these activity aspects.

The most important studies are chronologically set out below. They are generally the studies which made most progress toward the inclusion and study of activity aspects.
--(1): Late 19th Century, Frederick Taylor's *Time and Motion Studies*. These were psycho-physical and experimental-psychological laboratory research studies, using the first consistently set up Time-Budgets extending over the period of the day spent at work. They provide an early instance of dynamic analysis not well enough observed by many contemporary and later researchers into time, but developed most expansively by market researchers and management.

This brings us up to 1900: Studies 2 to 7 inclusive cover the period up to 1932.

--(2): 1913, Bevans, *How Working Men Spend their Time*. A comparative-descriptive account significant for the inclusion of the total daily spectrum of activities, but lacking any thorough configurational analysis of, for example, free time vs. work time.

--(3): 1914-26, *Economic and Social Studies by Planners in Russia*. Early in the communist regime surveys of family money, and later, time-budgets were carried out as gross configurational studies to identify areas of activity and behavior which might be subject to policy and planning manipulation, but also as a measure for time series and longitudinal comparative analysis of the state's process of development.
This is probably the first example of recognition of the potential of a continuing time use inventory. However, judgements were (and are, see below) made as to the adequacy of the use of time on the basis of efficiency alone—this tended to concentrate research upon certain descriptive aspects of activity and some inputs such as participation. Communication, Contact and Motivation as well as any notion of output are necessarily obscured or omitted.

Russian planners have continued their Time-Budget investigations on a more massive scale than any other country: one Siberian study center alone has collected 30,000 man-days of information since 1953. Certainly this is useful data in view of a purpose of opening up new sources of labor and the better exploitation of labor reserves in industrial and agricultural production, but its narrowness imposes restrictions on the investigation and sensitive analysis of fundamental activity routines and behavior. For our purposes, information such as that which shows "that roughly 100 billion man-hours were spent yearly on primitive household work that could be done as well if not better by machines or with the aid of mechanised central services," is of little value. For any cross-national study of culture and change it is also
probably too scanty—we shall leave the Russians at this ill-tuned pitch.

In W. European and American sociology the Time dimension found most extensive application in the studies of free time and Leisure time. With the economic boom, and hoped for affluence, the problem and sociology of leisure was very much in vogue.

--(4): 1927, Crawford, *The Use of Time by Farm Women* (Idaho),

--(5): 1928, Frayser, *Use of Time in Rural South Carolina*,

--(6): 1929, Wilson, *Use of Time by Oregon Farm Homemakers*. These are three of a set of five major rural studies producing fairly mundane descriptive and partially comparative studies interested in the sociological aspects of time expenditure. They include, however, notions of contact and communication (implicitly rather than explicitly) along with the participatory aspect of activity. The notion of outcome is not investigated—everybody, we presume is happy down on the farm.

Wilson's study is interesting in its inclusion of observations on the physical design of homes as it relates to activity efficiency and convenience, an early example of environmental effects on activity structured by time.

Fortunately the data from all studies was well categorised, at a gross level, and has been used in a comparative time series study at the Survey
Research Centre at Michigan. Obviously, the results are of value only in as much as the validity of the comparisons is assured and agreed, but fascinating changes and constancies have been observed.

--(7): 1934, Lundberg, Komarovsky and McInerny, Leisure a Suburban Study. Here is a monument to the 1900-1930's era. It is based on extensive and methodically digested data collected in Westchester county from 1930-32. (With regard to the topic of the study, we can only presume that the country was marginally affected by the depression and that leisure was of fundamental (time) importance.) Basically sociological, the study attempts to arrive at a schedule of time expenditure for different groups in the community. But an additional questionnaire develops this (stereotypical) approach to include investigation of 'good time' activity patterns by place, companionship and activity satisfaction. It also includes some basic forecasting techniques for preference of activity given certain open opportunities about money, time and accessibility.

The period 1932-1950 is another defineable bloc in the development of studies within our interests. Despite a certain change of emphasis in the general stream of sociological work, leisure activities and facilities still seemed
to fascinate the Time researcher. This period therefore
marks not a change of subject or concentration on activity
type, but is characterised rather by a development of new
sources of information and interest in more aspects of the
activity routine.

--(8): 1937, Thorndike, How We Spend our Time and What We
Spend it For.

--(9): 1938, Riley, Dynamics of Non-family Group Leisure.

--(10): 1940, Zawadski, The Psychological Consequences of
Unemployment. Study (10) is a different and, we
suspect a more pertinent viewpoint on Leisure--
enforced leisure. Study was based on the analysis
of diaries kept by the unemployed male respondents.

Common to these three (and other) studies is a con-
tinuing concern for participation and the complex
of communication, and for satisfaction related to
sequential rules underlying Activity. Both Riley,
who used the town newspaper as a record of time use
over a 75 year period, and Zawadski tap new informa-
tion sources. Riley gives an overview which
approaches a planning oriented description more than
a sociological one, and this in a simple direct
manner.

--(11): 1944, Liepmann, The Journey to Work, and

--(12): 1944, Blum and Candee, Family Behavior, Attitudes
and Possessions, are both studies which at once en-
rich the fund of sources of information and the prob-
lems potentially amenable to a time study. Also,
they make adequate reference to description and the more obvious inputs of activity (neglecting much of communication motivation and contact). The configurational approach is well illustrated.

--(13): 1939, Sorokin's, *Time Budgets of Human Behavior*, probably did more than any other book at that time to popularise the Time-Budget technique as a sociological method of research. Its emphasis is totally on configuration and sequential rules--after this point the technique of analysis is so institutionalised that it does not require further comment.

Participation (some communication) and motivational aspects are considered, as are satisfaction (but no other outputs) and place (in a sense corresponding to descriptive aspects of activity). The latter are examined in theoretical rather than data based fashion.

A census method of time-budgets of activities as they change over time is suggested in some detail; it provides further instance of the consonance, (theoretical at least), of a time measure related to activities, in the particular sense in which Sorokin conceptualises them. Surprisingly, there is no caution as to the periodicities of change to be elicited by inclusion in the census of the social time (meaning, sequence and use) variable, which we
noted to be one of Sorokin's major interests.
(Sorokin's data has also been used in comparison with 1965 data, at Michigan University, Survey Research Center.)

The years from 1950 to the present have seen the greatest spread in the field of investigation by time-budgets, and have allowed for consolidation of the theoretical and practical interests of researchers to encompass most of the aspects of activity relevant to environmental concerns. The studies are many and we will require to be selective. Some division by country is applicable.

--North America: 1950-67, saw greatest application of the time-budget technique in continuing research into free time. The studies generally show little advance upon those already noted. We need only mention:
--(14): 1959, Larrabee and Meyerson (Eds.) Mass Leisure,

As isolated studies following important directions of investigation we should note,
--(16): 1957, Bell and Boat, Urban Neighbors and Informal Social Relations,
--(17): 1959, Reiss, Rural-Urban and Status Differences in Interpersonal Contact.

Both are sociological in bias and make little reference to descriptive activity aspects. They
develop, however, interesting measures of both input and output, with particular emphasis on the communicative, participatory and contact aspects; output has a tendency to be theoretically embraced rather than measured.

Reiss' study is especially noteworthy for its simple adaptation of the time-budget questions--with whom, how often, etc. By classifying, for example, the with whom question as to primary and secondary contacts (with sub-classifications) and as to impersonal and personal contact, he easily obtained an amount of quantitative data with rich qualitative overtones. It is such simple adaptations of the technique in a way that permits the range of enquiry to come closer to a description of the total of urban activity which suggests that the marriage of a time-related structure and an activity structure comprising a complex of aspects may be reasonably appropriate.

At a theoretical level both studies effectively used time structured data gathering methods in a questioning of the extent to which we can causally relate metropolitan or urban life to a depersonalisation of human contact and association. (Work by the following author picks up this direction.)

--(18): 1959, Meier, Human Time Allocation: A Basis for Social Accounts,
For some 10 years Meier has been emphasizing the importance of measuring the activity variable. Primarily, his interest is in the participatory, communicative and participant output aspects; measurement of these aspects cross-sectionally and longitudinally is highlighted. The time-budget of What, When, Where etc., through How regular, is the only advocated measure.

Our criticisms, by now, fall easily into line—

1) omission of the other aspects of activity and limited reference to an overall structure for these aspects, and 2) limitation to but a few aspects of the time variable at both the theoretical and operational levels. Certainly we can agree with the general statement of intent which asserts that (1967), "no longer will the relative mortality rates, or the wealth of the locally-owned mercantile and manufacturing groups, or the jobs opened up in export industries be, primary determinants of success"—(we have already argued that environmental accommodation to and of activity routines
and the tipping point in location choices, particularly in advanced societies, is more and more to be found in how well behavior patterns are understood. But when confronted with the new "concept of efficiency as applied to cities" as nothing but "an emphasis placed upon the freedom to participate, and transact," we may question Meier's ability to (1959), "prepare well founded indexes that confirm or deny" that "one city is more civilised than another." As Chapin observes, it is not clear "how the analysis would proceed from sampling information flows, to identifying transactions, to constructing activity patterns," (to defining space use patterns).

The above comments apply equally to the work of Chapin (see writings referenced below) save that Chapin, curiously, is capable of acknowledging (instead of omitting) many of the concomitants of the time-activity debate while stolidly refusing to include them in his schemes. Of note therefore in respect to the theoretical concerns of Chapin, and of Meier, is a lack of connection between the actuality of activities in time and any larger behavioral system or process which would suggest the potential activity range and interests of various groups, as a general delineation prior to more exact theoretical
and operational investigation. This larger beh-

havioral system would as we have seen be indepen-

dent of, and of greater instructive imperative than,

the continuing process (already noted) of activity

evaluation and reformulation: it would answer why

an individual chooses or is forced into a certain

general activity sphere, rather than how satisfactory

or unsatisfactory he feels it to be. It would be

suggestive of ways in which routine reformulation

might occur, especially location.

As previous writing suggested, Section 3 will

examine this theoretical link and will suggest the

Time Horizon (TH) and Time patterns of expenditure

(TPE) as guide to an individual's general activity

sphere, prior to the actualities and exactness of

routine. (The TH and TPE will be presented as

aspects not necessarily synonomous with activity.)


--(23): 1967, Chapin, *Activity Systems as a Source of

Inputs for Land Use Models*,

--(24): 1968, Chapin, *Activity Systems and Urban Structure:

A Working Schema*.

One of the latest time-budget studies seems, fittingly,
to be cognizant of many of the concerns of the above
criticism and to develop a comprehensive and sensitively
formulated research. It is, however, little concerned
with theory; it bears upon a particular and well defined situation. It attends, in part, to a behavioral system (which is measured by a TH), outwith activity aspects embraced by the time-budget.

--(25): 1967, and onward, Tilly and Michelson, The Physical Environment as Attraction and Determinant: Social Effects of Housing. The study is interested in the revisions of a) time-budgets and other time aspects, and b) of activity routines, as experienced by relocated families. It is a six-year longitudinal study, and will question:

--the reasons for a family's decision to move--i.e., what are the felt constraints of their present location (in respect to Time Horizon and the particularities of activity routines and time expenditure);
--felt needs about time expenditure and activity routines which influence selection of new location;
--factors affecting execution of preconceived plans after moving;
--to what extent, and how satisfactorily, does the physical setting influence what people do, with whom they do it, where they do it, etc.

In fine, consideration is given to TH which influences the expenditure of time on a particular activity routine, which is subject in turn to modification by major change in the TH (which may be
class related) or by specific evaluation of the routine, or both.

We are able to utilise lessons of the above study in the formulation of our test case.

France: probably has produced the most extensive and methodologically interesting applications of the time-budget process since 1945. Beginning with the first time-budget study by Jean Stoetzel into phenomena of Urbanisation, one of the tendencies of the French research has been the analysis of the global mode of life of certain population strata in connection with their employment and their adaptation to urban environments and industrialisation. A limiting of interest to cultural-sociological facts as is noticeable in most cases in American (and also West German leisure sociology--see below) is absent in this trend of research, as is the accompanying, often artificial, limitation of the period under observation (in the time-budget) to a work-free fragment of the day. This leads, logically, to drawing into the field of observation of the time-budget record, the immediate micro-sociological and physical environs of the individual, above all the family, and beyond that the neighborhood and job group. Interesting complex time-budget analyses have resulted. (TH and larger behavioral/activity system is not investigated.) A most important study is,
--(26): 1956, de Lauwe, *La Vie Quotidienne des Familles Ouvrières*, in which the connection and the reciprocal effect of time division and time budget of married workers is especially studied. A partial attempt is made to draw in financial budgets, toward a refined analysis of economic conduct and perhaps of more general ways of behavior.

Another interesting research trend is the investigation of the impact of technical advances and the new demands of industrial activity in them. Research on free time as an independent 'sociology of leisure' is also strongly represented.

**Other European Countries:** the following is a quick round-up included for reference more than in pursuance of the main arguments of the text. In *West Germany*, leisure-time has been a favorite study area, coupled with rigorous examination of (and fair progress in) the methodology of time-related research.

*Poland*, similarly, is concerned with methodology; some recent research into the sociological and environmental conditions of working women come encouragingly close (judging from report) to the spectrum of our concerns. But, as in most communist countries, much of the data gathered is related to identifying areas of potential policy intervention in the efficient use of time and activities.
Bulgaria follows this course and has for several years produced systematic reports on the living conditions of the working class. Hungary, instituted, in 1963, what is probably the first time-budget (a one-day budget of each fourth family of a national micro-census) forming part of an official census. Leisure is also studied—perhaps it too can be efficiently handled by policy decision.

Szalai reports that in East Germany, and Czechoslovakia, "time-budgeting" has "come very much in vogue as a tool for planning all sorts of communal services, traffic, shift schedules etc." A liberal interpretation of this general statement would suggest that the activity variable as overlay to the spatial seems to be well recognised and, encouragingly, accommodated by a time measure.

Finally, a word on the International Multi-Nation Time-Budget Project: for a single 24 hour period random time-budget samples were obtained from approximately 2000 of the urban employed and their families in 13 survey sites (small industrial cities) from 12 participating nations; 96 activity categories were used. Analysis has substantiated that societies have characteristic and identifiable patterns of time allocation, and that there are trade-off phenomena in social activities which on many occasions take the form of functional equivalents. In view of its major intentions, the study has been very successful; it has proved the instrumentality of time-budgets for getting at the social organisation of time itself.
But, during the development of the project, researchers saw further possibilities, possibilities which make it pertinent to this investigation. Thus Robinson, the American representative, reports that, "although analysis has dealt only with types of activities, analysts of social change may feel that types of inter-personal contact and the location of activities may be as interesting and as important as the activities themselves." When the interest and resources of such a massive undertaking are thus directed and evaluated we may be sure that

- time-budgets and associated time measures will be quickly institutionalised as effective research tools,
- that the research distinction as to what are acceptable sociological and environmental (perhaps anthropological) concerns will be progressively eroded,
- that the Time/Activity debate and the conjunction of these two variables for purposes of theory and research, are valid and useful operations.

What the above Section and Conclusion (c) have shown is that there is much empirical evidence offered by a literature search which confirms the validity of the main direction of this study. We have a measure of face validity, to borrow a term, confirming that time-budgets are likely to be good measures of many of the aspects of activity--of Description, Input and Output. We separated Time from Activity on the
premise that activities might be more (in planning terms) than just What occurs When. Other authors have been similarly concerned, though without making specific list of aspects of the two variables and of ways in which they match (or otherwise). That they have been able to effectively match the variables is reflected in the above comments on selected studies.

Part B: Other Time Aspects and Activity.

Examples of the use of other aspects of Time as explanation of activity are less numerous than for Part A. They fall into 2 categories:

1) Anthropological and Sociological writings observing Time Horizon and Social Time in their relationship to activities as a class or group phenomenon; we have already noted that Banfield and Martineau distinguish class TH's--both also relate these TH's to activity distinctions,

2) Experimental psychological studies of TH in illness and certain social pathologies, and the use of behavioral experiments to affect class or group induced TH's.

Category 1): implicitly anthropologists and sociologists have long recognised the influence of TH and Social Time on behavior and activity. (Psychology and psychoanalysis is similar in its concerns.)
We will not investigate the many available sources except to mention that the work of Levi-Strauss has, of recent, been emphasising the time variable; (Mead, White, Leach, Bridgman, Sorokin and Lewin offer equally interesting directions for study).

The racial situation and the Poverty Syndrome have lately focused interest in 'time deviance' as it affects behavior. Minorities, none the less important for their size, are found to differ appreciably in their conception of time/behavior goals (and ways of acting them out) from the middle class dominant conception which emphasises future orientation, deferment of gratification and consonant activity routines: Henry's and Horton's studies of 'Colored Peoples Time,' and Banfield's forthcoming treatise on class, TH, and activity are instances of research in this direction. Indeed Banfield maintains the key and understanding of nearly all behavior to be available in the TH, even to the point where in riots the propensity of the Negro Lower Classes (with short TH's) to steal liquor, TV sets, radios and food is explained by the ability of these goods to bring immediate deferred gratification; jewelry and fur stores, for example, offering articles of high value were not looted because the disposal of articles from them requires planning of action, transaction and concealment of reward until a later time when police suspicion has abated. 9
The important theoretical distinction of the above works is that they see variations (by class etc.) to be explained by time and its use: in contrast, many theories have viewed time as unequivocally *constant*, at least in respect to TH. To explain, the Lower Class Status Frustration and Social Disorganisation School, represented by influential sociologists such as Parsons, Mills and Zetterberg, state that

a) lower class persons, motivated to attain success values in a manner similar to the middle class (i.e., a long range picture of achievement), are blocked in their ambitions by socially structured barriers which thwart ambition and suggest injustice, resulting in deviant adaptation. The linking of this motivational theorem to the status frustration hypothesis is that,

b) concern about the evaluation of oneself by others is the basis of status concerns, such that if the avenues of the enhancement of one's self esteem are blocked then status frustration follows; status frustration leads to deviant behavior "if one is aware of the external sources of frustration." 10

All this supposes that (Roach) "the lower class boy (and his parents!) absorbs dominant middle class values which set goals for him that are in keeping with the long range picture of American life." 11 By adolescence, then,
he has developed conceptions of himself, in the social structure with appropriate roles and statuses. Frustration of these conceptions occurs.

Recent research shows, to the contrary, that low aspirations, short TH, little concern with status, and cognitive restrictions on the comprehension of the implications or possible alternatives in critical life choices (e.g., the job), are all characteristics of the lower class. Behavior cannot be explained as a frustrated realisation of a middle class norm. Rather, the culture of the class and especially the TH variable dictates behavior and activity at variance in its goals with that of the middle class. Activities are confined to those areas which are reflective and supportive of lower expectation, to those which more closely match the reality of possibilities. Attention is given to an inter-related holistic assessment of a Group or Class (see Oscar Lewis and Rainwater) in a specific Time and Space milieu, not in a subverted milieu vainly attempting to mimic its middle class counterpart. (Besher's Urban Social Structure, chapters 1 and 2 provides a thorough, if somewhat scathing review of the Social Disorganisation viewpoint.) Patently, there is extreme in both these positions—in an Analytic processual statement of class behavior, opposed to an Holistic system statement emphasising the inter-relatedness of class phenomena. Our argument and review of the two
schools of thought would suggest that the Holistic approach will give an overview with a richness of explanation not offered by the logico-deductive process of the Analytic school (which in any case failed to provide data supportive of many of its hypotheses).

Banfield claims that our society is becoming increasingly present oriented! Paradoxically, he maintains that we are also approaching near total middle-classification, a state normally associated with long TH's. Perhaps the status frustration concept can be re-invoked to explain this condition for its suppositions are more closely related to it--frustration, in full knowledge and awareness, of goals which society sets but refuses to realise: perhaps, as we inculcate the lower class and absorb some of their values we will reckon the price of societal goal fulfillment, (if this is possible), as too high for the benefits received.

The theoretical relevance of TH to behavior and activity fits well to the purpose of this study.

Category 2): experimental and social psychology offer research confirmation of some of the theoretical tenets of a time explanation of class (see above). Notable is Leshan's investigation of social class with respect to a collective-ego of space-time, as defined by Erickson, which "concerns the perceived relationship of the individual and his goals in time." The use of a story telling technique showed lower class children to prefer short stories with quick sequences
of tension and relief, little frustration for long periods, and no plan of action toward future goals. Stories lengthened upward with class. (Fink used similar techniques in observing shortened time perspectives with age, and institutionalisation. Davids and Parenti showed TH to be very short in young children.)

Barndt and Johnson used Leshan's technique in a correlational study of delinquency and story telling, which could, in turn, be related to class. Wallace found, by different methods, that Schizophrenia can be correlated with short TH. Leshan found low achievers to be characterised by short TH's, and high achievers to be optimistic with longer TH's. There are many similar studies.

The danger with these latter correlational studies is their normative suggestiveness. Quickly one makes the relationship between TH and class--perhaps the way to make the lower class into higher achievers is to increase their TH (or would the aim be to make the middle class lower achievers)?

The facts are that TH in correlational studies is not often defined with respect to any length or type by which it can be located as Lower or Middle or upper class. Researchers just use loose definitions such as 'longer' or 'shorter'--short in comparison to the middle class or long in comparison to the lower class? Also, no causality is suggested by the findings of these studies; thus a short TH
does not cause delinquency or deviancy. Rather, the middle class may impose negative sanctions on activity which is necessary to a short time perspective and thus brand it as deviant, whereas it is, in fact, essential to the life pattern from which it derives: we return to the need for a holistic functional evaluation which explains activity by class models. (Undoubtedly an individual with a short TH which does not allow him to weigh the costs of imprisonment, say, in a future-oriented fashion may be more prone to the immediacy and reward of certain delinquency, theft, for example.)

In this Appendix we have (1) identified a potential time/activity relationship, and have (2) examined the utility of that same relationship in a number of ways in a number of studies. It would appear to be useful in both theoretical and practical operational conditions.

From our literature search in this Appendix there are some indications of the way in which the two variables should be conjoined. Section 3 suggests this study's solution at both a theoretical and operational level. Section 4 tests some of the proposals offered in Section 3.
APPENDIX II:

THE QUESTIONNAIRE SCHEDULES
OF TIME BUDGET INFORMATION
GATHERING
APPENDIX II: The Questionnaire Schedules of Time Budget

Information Gathering

The following presents the three part Questionnaire Schedule used in the Test Case (Section 4). The parts are
--Pre-diary Interview (and explanation of project),
--The Time/Activity Diary (with Instructions),
--The Post-diary Interview.

The principles governing formulation of the Schedule are recorded in part (B) of Section 4: Test Case.

The Diary, and Instructions for its completion are presented first, prior to the Pre-Diary and Post-Diary Interviews.
How To Complete the Diary (see sample Diary page on page 159).

The diary is designed to record what you do during the day, at all times. In columns 3-8 it will also record some information about each activity which is additional to its time and length of occurrence. The way to record this additional information is indicated below, but first a word on the activity descriptions you will make in the first and second columns (i.e. Activity and Place).

In the first column (Activity) you should describe the activity in each row. Use your own words: we have given some examples of the kinds of things you may be doing.

The rows are, for the most part, divided into ½ hour (or 1 hour) intervals. If during that time you change from one activity to another, describe both (or more) activities in the row, and fill in the following rows for both activities. At the end of the description of each activity make a note, in brackets, of the time that you stopped—e.g., (12:30). If you find that you have 3 or more activities in any row, you should save yourself extra work of description by omitting minor activities or by summarising them under one heading—e.g., work around the house.

It may happen that you are doing a major activity and still doing a number of other things at the same time—e.g., watching television while playing cards. This is different, obviously, from doing several things one after another. In
this case note the main activity and fill in all other columns for this activity only; but do make a note in the first column of other things that you are doing at the same time.

Column 2, Where, is self-explanatory. If the name of the place is not likely to be known to the interviewer make a note to the effect that the place is near, say, Boston Common, or North Station.

How to Complete the Contact and Communication Columns (3, 4, 5, 6 and 7).

Contact (Columns 3 and 4): These columns are to be completed by numbers representing different types of Contact which you have with people while engaging in activities.

Column 3, With Whom, refers to the person or person's status, defined by his or their relationship to you. You should fill one of the following numbers in Column 3 beside each activity:--

(0) Alone

(1) Intimate Kinship, such as nuclear family members and extended kin members.

(2) Close Intimate friends, friends defined as 'very close,' 'my best friend,' etc.

(3) Close Associate or Client, a close friend deriving from a work context, whether or not actually seen at work.
(4) **Good friend**, a friend defined as 'close,' 'just a good friend,' etc.

(5) **Distant Associate or Casual acquaintance**, either, a fellow worker who is not defined as a friend or a person with whom one has a "speaking acquaintance."

(6) **Cordial Recognition**, defined as a person whom one recognises in address, or "just someone I say hello to."

(7) **Pure Client**, defined as a person whom one doesn't know personally, but one with whom contact is made or with whom interaction takes place in a client relationship.

(8) **Stranger(s).**

Where there is more than one type of person engaged with you on the activity place their respective numbers in the column, as instructed above.

**Column 4** is, obviously, to be completed by noting the total number of persons engaged in the activity. If there are large numbers of people, simply make a rough guess—we will appreciate your difficulty. If there is more than one type of person recorded in Column 3, then Column 4 should contain a number for each type.

**Communication (Columns 5, 6 and 7):** These columns are to be completed by numbers and letters. The method is the same as above.
Column 5. Direction--this records the primary direction of Communication between you and people or things that you are in Contact with. We use Communication to refer to the kind of messages, information, or affection and comfort that you receive from persons and situations. So, for each activity, indicate the main Communication source--is it:

1. Communication which comes from another single individual to you
2. From you to another individual
3. From the environment to you. (By environment we mean anything that is non-human, such as a TV, or a stage show.)
4. From you to the environment. (This means that you are acting on anything in the environment other than yourself or other people--e.g., painting a wall, gardening.)
5. Communication with yourself, day dreaming, meditation, personal care
6. You, as individual, communicating to a group
7. Group communicating to you--e.g., watching a play
8. You, with a group, communicating to the environment
9. You, with a group, communicating to another individual
10. You, with a group, communicating to another group
-155-

--(8), (9) and (10) refer only to situations in which you feel that communication from you as a member of a group is more important than your own individual communication. If you were in a play, for example, your part would be bound up with that of the group and would rely on them; at a party, however, you might be in a group talking to someone (or persons) and in this case your communication would not be of type (9) or (10). It would be you, independently communicating to another person--type (2).

The following diagram may help you to remember and locate the types of direction of communication.

Direction:

Column 6, Mode, simply asks how the Communication reported in Column 5 took place, was it by

(a) Word,
(b) Action (demonstrative only),
(c) Word and action,
(d) Sounds other than verbal (such as music),
(e) Action with an Instrument or part of the Environment (writing, painting the house),
(f) Silence, thought communication (e.g., walking in the country),

(g) or by combinations of some of the above Modes. If there is more than one mode, put the appropriate letter(s) in the space provided.

Column 7, Exchange, seeks to determine what exchange, if any, took place during each activity. Did it entail

(a) Communication of Information (such as studying),

(b) or of goods or material objects (such as shopping),

(c) or of Inconsequential talk, argument, and pleasantries? (Things which pass the time and are necessary to everyday living—you can include light entertainment in this category. But concentrate mainly on social acts which we all engage in, and not on the personal ones included in (d)).

(d) Refers to communication that is personal, including day dreaming, personal care, and affection etc.

(e) Combinations of (a), (b), (c) and (d) should be recorded by placing all relevant letter(s) in the space provided.
Column 8, Motivation, is designed to find out why you engaged in certain activities. Against each activity try to describe the reasons or desires or impetus which prompted you to engage in the activity.

You may feel that this is very obvious, that your activity record is sufficient information. On occasion it will be, but mostly it will not give adequate information; if, for example, you make a phone call, is it a formal call to get information, or a social chat with a friend; if you play some game or sport, is it primarily for recreation and exercise, or out of a social interest to be with friends. We will appreciate condour in filling out this information--at the same time we will respect the difficulties (of both embarrassment and of honestly knowing oneself why one does something), which may prevent you from complementing every activity with a comment on Motivation.
HERE ARE SOME EXAMPLES OF THE KIND OF ACTIVITIES WHICH YOU MAY DO DURING THE DAY

(BUT PLEASE USE YOUR OWN WORDS TO DESCRIBE WHAT YOU ARE DOING)

<table>
<thead>
<tr>
<th>TRAVEL:</th>
<th>All the trips you make, both at home and at work.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK:</td>
<td>Actual work; work breaks; delays or sitting around at work; work meetings or instruction periods; meals at work; overtime; work brought home.</td>
</tr>
<tr>
<td>HOUSEWORK:</td>
<td>Preparing meals and snacks; doing dishes; arranging and straightening things; laundry and mending; cleaning house (inside and outside); care of yard and animals; repairs.</td>
</tr>
<tr>
<td>CHILD CARE:</td>
<td>Baby care; dressing; helping with homework; reading to; playing with; supervising; medical care.</td>
</tr>
<tr>
<td>SHOPPING:</td>
<td>Groceries, clothes, appliances, or home furnishings; repair shops; other services (for example: barber, hairdresser, doctor, post office).</td>
</tr>
<tr>
<td>PERSONAL LIFE:</td>
<td>Eating meals and snacks; dressing; care of health or appearance; helping neighbors or friends; sleep or naps.</td>
</tr>
<tr>
<td>EDUCATION:</td>
<td>Attending classes or lectures; training and correspondence courses; homework; reading for the job.</td>
</tr>
<tr>
<td>ORGANIZATIONS:</td>
<td>Club meetings or activity; volunteer work; going to church services; other church work.</td>
</tr>
<tr>
<td>GOING OUT:</td>
<td>Visiting (or dinner with) friends, neighbors or relatives; parties, dances, nightclubs or bars; sports events and fairs; concerts, movies, plays, or museums.</td>
</tr>
<tr>
<td>ACTIVE LEISURE:</td>
<td>Sports or exercise; playing cards or other games; pleasure trips and walking; hobbies, knitting, painting, or playing music.</td>
</tr>
<tr>
<td>PASSIVE LEISURE:</td>
<td>Conversations; radio, TV, records; reading books, magazines or newspapers; writing letters; planning, thinking or relaxing.</td>
</tr>
</tbody>
</table>

THIS PAGE WAS GIVEN TO RESPONDENTS ALONG WITH THE DIARY SHEETS
( It was stressed that these Activity categories be taken as example and suggestion only).
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>PLACE</th>
<th>CONTACT</th>
<th>COMMUNICATION</th>
<th>MOTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>What did you do? Describe your activity in each Time Interval.</td>
<td>Where</td>
<td>With Whom</td>
<td>How Many</td>
<td>Explain briefly why you engaged in the activities</td>
</tr>
</tbody>
</table>

I HOUR OR 1/2 HOUR INTERVALS: Diary, begins at midnight.
PRE-DIARY INTERVIEW

We are trying to find out the kind of activities upon which people spend their time. That is, we want to know how people divide up their time and spend it on certain activities.

We'd be interested first in the kinds of things that you do during the day.

(1) What is your occupation: _____________________________.

(2) What are the main things that you do on that job or
   (for students) in that course: ____________________________
   ____________________________

(3) We'd also like to know about the way your time gets
    divided up when you are on the job; or (for students)
    when you are in school (i.e. during the academic year).

* (Interviewer: Change to first person singular for all
   further questions).

** FOR EMPLOYED PERSONS (Regular job of more than 14 hours
   per week):

(a) How long do you spend in a normal work day on
    paperwork; typing, keeping records, working on
    reports, charts etc.;

(b) How long is usually spent working with tools, machines or other equipment;

(c) How long is spent dealing with people; talking to fellow workers or customers about things related to your work;

(d) About how much of your time are you able to spend talking to people about things not related to your work;

(e) Is there part of your work day when you regularly
    just don't have any work to do: No_____ Yes_____,
    over a week how long would this be: ____________________________

* Bracketed remarks are instructions to the interviewer.

** Capitalised remarks are both instructions and markers
   of change in the content and interests of the questionnaire.
FOR STUDENT GROUP

(a) How regular is your system and schedule of working: (3 groups), fairly Regular and predictable, irregular but subject to periodic (i.e. predictable) fluctuations, Very irregular, random, and unpredictable.

If REGULAR ask,

(b) How many hours of your typical day are spent on Classes, Seminars and Lectures;

(c) How many hours spent on library work, reading and preparation of papers;

(d) How many credit units do you have;

(e) How long do you usually spend in informal discussion and socialising which is, in the main, related to your course of study;

(f) Do you have any special teaching or research work which takes up part of your day;

(g) How many hours do you have free each day;

(h) How do your week-ends compare with weekdays, are they free or similar to weekdays;

(i) Over a week you have, therefore, about ________ free time.

If IRREGULAR, but PERIODIC ask,

(j) I understand that it is difficult for you to say how you typically spend a day, because of the variation which occurs in your schedule, but could you give an indication of the length of this period. Does the significant change in the way you spend your time occur over the period of;

a week; a fortnight, a month, a longer period.

(k) Can you tell me about the extremes of the period which you have identified by answering the following; (return to questions (a) through (i) asking for the extremes in each case, i.e. little work vs. much work). (h) and (i) may not be applicable.
If IRREGULAR and UNPREDICTABLE ask,

(1) Could you formulate some kind of average day for me; return to and complete questions (a) through (i); if answer is yes; No, circle, cross out (a)-(i)).

ASK ALL EMPLOYED RESPONDENTS (R's)

(4) On your main job do you have fixed daytime work hours, do you work special shifts or what:
Fixed daytime hours, Own choice of hours;
Hours obligatory but not really fixed as a shift;
Work special shift(s), (EXPLAIN),

hours worked ________________.
(if varied) what are the other shifts________________,

How long do you stay on any shift_______________.

(5) Are you doing any other kind of work for pay besides this main job right now: Yes, what kind of work

how many hours a week ________________________________,

how long have you been doing this______________________,

how long will you continue ____________________________;
No.

(6) Have you taken on any extra work beside your main job in the past twelve months (ask if answer to (6) is No):

No;
Yes, what kind of work______________________________,

how many weeks did you do this______________________,

how long did you work each week______________________.

ASK ALL STUDENT RESPONDENTS (R's)

(7) Just how flexible can you be as to when you work or take your free time. Though you work regularly (or irregularly--as the case may be) I can't tell if the periods of work must always occur in the morning, say. How would you describe your schedule:
Inflexible, I have to work at certain times,
Flexible but I like to work at certain regular times (note that an R may be irregular in the amount of work performed each day, but very regular as to the general times at which this /variable amount of/ work occurs),
Flexible, I like to work at all sorts of times.
(8) (If general times can be fixed ask),
What are these times when you work on studies:

(9) (If general times fluctuate but can be reasonably recorded as 2 or 3 separate periods ask),
Can you summarize these different periods for me:

ASK ALL RESPONDENTS

We're also interested in things people do in their spare time, when they aren't working.

(10) I have a list of free-time activities, and I would like you to tell me about how often you have been doing these things during the past year. For example, "Going to the movies." Would you say that you've generally been going to the movies once a week or more, every two or three weeks, half-dozen to a dozen times all year, one to five times a year, or not at all this year?

(CHECK APPROPRIATE COLUMNS)

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<tr>
<th>COLUMN</th>
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</table>

A. Going to the movies
B. Going to club meetings, activities
   (PTA, union, etc.)
C. Going to church (or religious activities)
D. Going to classes or lectures
E. Going to watch sports events
F. Fishing, hunting, camping, hiking
G. Boating, swimming, picnics, pleasure-drives
<table>
<thead>
<tr>
<th>COLUMNS:</th>
<th>1</th>
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<tr>
<td>H. Playing active sports (bowling, softball, etc.)</td>
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<td>I. Going to nightclubs, bars, etc.</td>
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<td>J. Going to concerts, plays, etc.</td>
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<td>K. Going to fairs, museums, exhibits, etc.</td>
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<td>L. Gardening and working around yard</td>
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<td>M. Making and fixing things around house</td>
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<td>N. Shopping, except for groceries</td>
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<tr>
<td>O. Helping relatives, neighbors, friends</td>
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<tr>
<td>P. Visits with relatives, neighbors, friends</td>
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<td>Q. Playing cards, other indoor games</td>
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<tr>
<td>R. Working on hobbies, painting, reading for 2 hours or more, or music</td>
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(See diagram 2, Section 3).

General Notes: The rows record "what" activities. The columns record "where", "how often" and "why" and "how regular". "With whom" is accommodated under the heading Contact which is to be categorized as follows; put appropriate number in column,

1. Intimate kinship
2. Close intimate friends
3. Close associate or client
4. Good friend
5. Distant associate or casual acquaintance
6. Cordial recognition
7. Pure client, (further definitions are not repeated --See p. 84).

8. Combinations of (1) - (7)

The "How many" people aspect which is closely associated with Contact, is to be inferred from the general situational qualities implicit in the activity descriptions. Remember that these activities are additional to the "normal" round of life which the diary seeks to elicit;
they are likely to be less frequent than other activity forms, and though they may have an importance disproportionate to their frequency it should be reflected first in a Value Study (See below). That is, if the activities are indicated as having a very dominant role, we would study this by further investigation rather than by this present crude measure which relies on recall for its answers. In such a further study aspects of Contact as well as of Communication, which is omitted from the Columns would be included.

"Where," how frequently (in 3 categories), can be recorded by the following code numbers

(1) Local Neighborhood - within a few blocks of home; take 5 blocks as limit.
(2) Within same City as Home
(3) Downtown
(4) Within Metropolitan Area
(5) Another city (or state).

"Why," is a direct question seeking the respondent's Motivation for engaging in activities. Try to suggest, by example, that visiting friends, say, may be a social duty rather than a pleasurable activity. Try not to prompt reply. Categorize responses by single words if possible, such as

Duty,
S.C. (Social Contact, Socialising),
Reward (Economic Gain etc.).

Make a note of abbreviations at the head of the page. Where Motivation corresponds to the nature of the Activity, tick the space ( ). Activity in each category may be variously motivated at different times; try to elicit a generalised summary.

Finally, explain the diary and arrange your next meeting with R to collect and check the diary.
POST DIARY INTERVIEW SCHEDULE

I would like to check over the diary in which you recorded your activities for the day of 

But first I require some general information.

(1) On the diary day, was it a;
    beautiful day,
    fairly good,
    average,
    fairly poor,
    very poor,
    mixed and difficult to describe

R EMPLOYED

(2) Was (diary day) a day of the week that you usually work:
    Yes; Did you work on that day,
    Yes, No; why not____________________;
    No; Did you work on that day,
    No, Yes; why was that

(3) Did you work the normal number of hours on that day: Yes; No, less or more

(4) Did you work the day before:
    Yes; No, explain

(5) Did you work two days before:
    Yes; No, explain

(6) Did you work first day after:
    Yes; No, explain

(7) Did you work two days after:
    Yes; No, explain

(8) (If work day is isolated between before and after non-work days, and this information has not been previously reported as usual routine make enquiries as to reasons for not attending work on previous or following days)____________________

____________________
(9) Was the diary day an unusual one for you in any other way. By unusual I am thinking of something that might have been on your mind, or something special you might have been doing which would have affected the usual order or method of your activities on that day:
No; Yes, explain

____________________________________________________

____________________________________________________

(get at the possibility that although activities might not be especially different, they might have been approached and structured in some special way).

(10) Not counting regular weekends and days off, how many paid vacation days have you had from your main job in the last year

(11) Did you use any of those days to catch up on other things or to earn extra money:
No; Yes, how many

(12) Where did you spend your last vacation

R STUDENT

IF R HAS INDICATED (IN PRE-INTERVIEW) LITTLE DAY TO DAY VARIATION, ASK:

(13) Was the diary day a typical day in terms of the way your time was divided up for activities:
Yes;
No, explain____________________________________________________

(14) Was the day before much the same (as the diary day) in the way time was used for activities:
Yes; No, explain

(15) Was the day, two days before the diary day, similar to the diary day:
Yes; No, explain

____________________________________________________
(16) Same as for (14) and (15) for day after and
2 days after:
Yes; No, explain__________________________.

(17) Yes; No, explain__________________________.

IF R HAS INDICATED PERIODIC FLUCTUATIONS IN TIME USE,
ASK:

(18) Was the diary day typical of this point in the
week (or month). I mean typical in the way your
time was divided up for activities:
Yes; No, explain

__________________________

(19) If NO to (18), ask--Do you think that the irregu-
larity which occurred on the diary day suggests
the possibility of a new periodic fluctuation:
New fluctuation, explain what

__________________________;
No, variation occurred by chance.

IF R INDICATED COMPLETELY RANDOM PERIODS AND
STRUCTURES (ROUTINES) OF TIME USE, ASK:

(20) You have indicated that your time is spent on an
activity in a way that changes randomly from day
to day. Even so, is there anything which makes
the diary day outstanding and different:
No; Yes,

__________________________

__________________________

ASK ALL R's

(21) Was the diary day unusual for you in any other
way. By usual I am thinking of something that
might have been on your mind, or something of
special importance or interest which you might
have been doing, which would have affected the
usual order or method of your activities on
that day:
No; Yes, explain__________________________

__________________________.
(22) Do you usually take vacation time off:
   Yes; No.

(23) Do you take a regular paid job during vacations:
   Yes; No.

(24) Is the way you spend your time during vacations
    very different from the way it is spent during term:
   Yes; No.

CHECKS ON DIARY REPORTING (AND POSSIBLE OMISSIONS):
ADMINISTER ONLY IF R HAS NOT REPORTED ACTIVITIES BELOW

("With whom" and "Who was present" refers to Contact,
and should be categorised as such. If question does
not include number of people, ask the next question,
"How many people").

(25) Did you listen to the radio on (the diary day),
    possibly while you were doing something else:
   No; Yes, when
   ________________________________
   how long__________________________
   what kind of program________________
   with whom_________________________
   how many people_____________________
   (where_____________________________).

(26) Did you watch any television on (the diary day):
   No; Yes, when
   ________________________________
   how long__________________________
   what kind of program________________
   with whom_________________________
   how many people_____________________
   (where_____________________________).

(27) Did you read any newspapers on (diary day):
    No, Yes, when
   ________________________________
how long_________________________________________________,
who was present__________________________________________,
how many people__________________________________________,
(where_________________________________________________).

(28) Did you read anything else, such as a magazine, book, report or pamphlet:
No; Yes, when____________________________________________,
how long_________________________________________________,
who was present__________________________________________,
how many people__________________________________________,
(where_________________________________________________).

(29) I'd like also to know of any conversations or meetings with friends, that you might have omitted:
None; Addition, when______________________________________,
how long_________________________________________________,
with whom________________________________________________,
how many people__________________________________________,
(where_________________________________________________).

(30) (same for), any time spent shopping, or having a coffee, or other personal activities; things that just take up time without us realising it:
No; Yes, when____________________________________________,
how long_________________________________________________,
with whom________________________________________________,
how many people__________________________________________,
where___________________________________________________.

(Where is not included in (25) through (29) on the supposition that the Diary will record some main activity and location to which these are
adjunct. If this is not so, go back to each question and ask "Where" as an extra enquiry, but do so only after administering question (30). The idea here is to go back over these questions again as a final jog to remembering other activities which may have been omitted--the assumption is that if R has failed to report an activity whose "Where" is not suggested (When he finally reports it in (25) -- (29)) by another activity in its time location on the diary, then he is likely to have made other gross generalisations or omissions. Be alert to this aspect of the interview design which can allow you to go back and press a previous point in more detail: Thus if, after question (30), you want to go back to the preceding questions because the newly remembered activity does not fit with the one reported as occurring at that time on the diary, you might say--"Am I correct in assuming that the (activity newly reported) occurred when you were (activity reported on diary)?" (Note the "Where" in the space provided if necessary, if there is no note we will assume your satisfaction with the congruency of the diary activity and the newly reported one).

PERSONAL DATA

For each R

(1) Sex: Male, Female.

(2) Race: White, Negro, Other__________________________.

(3) Marital status: Married, Single, Divorced, Separated, Widowed.

(4) Do you have any children 18 years or under living in this household:
    Yes; How many_____; How old_____; Do any work_____; If so, at what (give ages, and length of work day with each child
                           ________________________________.
    No.

(5) Do you, Own your home, Rent, Other__________________.

(6) How long have you lived here_____________________.
(7) Do you have a telephone; Yes, No.

(8) Do you have a Radio; Yes, No.

(9) Do you have a T.V.; Yes, No.

(10) Do you usually wear a watch, or have one with you; Yes, No.

(11) Do you have a clock here in the house which is usually visible; Yes, No.

(12) Do you have a car (in working, useable condition); Yes, No.

(13) Do you own any other kind of vehicle, bicycle, or a motorcycles, that you use; Yes, can you describe it___________________________. No.

(14) Do you have your own books; Yes, a few, reasonable amount, many; No (i.e. very few).

(15) Do you ever hire any paid household help; Yes, full time, part time, now and then when you need it. No.

(16) Do you have a yard or other open space connected with the house (or apartment) which you can use; Yes, description (size, and general character)_______________________________ No.

(17) Do you own or have special access to any open areas (any size) near here; Yes, No.

(18) Do you have any other home or dwelling which you regularly visit; Yes, how far away it is_____________________________, brief description______________________________, No.

(19) How far is this house from the place where you work or study ____________________________________________.
(20) How long is a normal trip from here to work______.

(21) (If R works or studies at several places note changes in distance and time by day, week or month)

_______________________________________________________.

(22) How do you usually get to work (note combinations)

_______________________________________________________.

(23) (How does mode change as work place changes)

_______________________________________________________.

(24) Education, (unless obvious)__________________________.

(25) Are you taking any other special courses or training, or do you have any other interests that take up your time, which we have not covered;

Yes__________________________________________________,

No.

(26) Were you brought up, on a farm, in a small city, or in a large city?

(27) When you left the farm/or small city, what were the main reasons for moving

___________________________________________

___________________________________________.

(28) Starting from age 20, what other places have you lived in for 6 months or over, (not counting changes of suburbs in same metropolitan area).

<table>
<thead>
<tr>
<th>PLACE</th>
<th>STATE</th>
<th>LENGTH OF STAY</th>
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<tr>
<td>a)</td>
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<td>etc.</td>
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VALUE (AND PREFERENCE)

for all R's

(29) Suppose that early on (DIARY DAY) you discovered that something had come up suddenly. You could tend to it any part of the day or night, but somehow you simply had to find one hour to take care of it before you went to bed again. In a day like the one you had on (DIARY DAY), what things would you have given up to make room for that hour?

Activities replaced_________________ Time gained______

_________________________ ________

_________________________ ________

(30) Suppose the thing that came up unexpectedly would take 3 hours, but not necessarily all in one piece. What other two hours would you give up to make room?

Activities replaced_________________ New time gained: ______

_________________________ ________

(31) Suppose that in your day you found you had an extra hour of free time, to do with whatever you wish, what kind of activities would you engage in during this time ________

(32) If you found yourself with up to 6 hours of extra completely free time over the period of a week, what would you do with this time ________

(33) (Reread (32) replacing '6 hours' by '12 hours'). ________

(34) If over a month you found yourself with 3 or 4 free days what would you do with this time ________
FINAL OBSERVATIONS

(1) Type of Dwelling Unit______________________________.

(2) Occupancy Type and Number and Density; (i.e. Families/Single Persons, in 14 units (apartments) of small size in a neighborhood of similar buildings)

____________________________________________________

(3) General observation on the demographic characteristics of surrounding houses (or apartments) and neighborhood

____________________________________________________

(4) General observations on relation of house (or apartment) to proximate facilities such as shops, cinemas, libraries. (See also attached map);

(5) Distance of house (or apartment) from Central City;

generational location______________________________.

(6) Distance of house (or apartment) from other Regional or Sub Regional Centers of major importance

____________________________________________________

(7) Which is more used by the respondent
Central City,
(Sub) Regional Center,
Both the Same,
Neither (relies on local services).
(8) Are there any special facts about R (e.g. very tired, under pressure) that should be recorded;

(supplementary information only, that would influence the way in which he responds to the diary and interview situation)

(9) Comments on the Interviews and Diary Record in regard to;

 Ease of Interviewing R (Co-operative, etc)__________.

 Interruptions to Interviewing__________________________.

 Others present_____________________________________.

 How careful was R in making Diary; Very, Moderate, Sloppy.

 How many times (a guess) did R make entries in the diary during the diary day; Four or more, less, one.
FOOTNOTES

Introduction
1-Fraisse, The Psychology of Time, p. 5.
2-Heidegger, Being in Time, p. 43.
3-op. cit., #1, p. 5.
4-op. cit., #1, p. 9.
5-Blumenfeld, lecture.

Section I
1-Szalai, Trends in Comparative Time-Budget Research, p. 3.
2-Chapin, personal communication.
3-Sorokin, Time Budgets of Human Behavior, pp. 77-80.
5-Robinson, Social Change as Measured by Time-Budgets, p. 2.
8-Banfield, Notes toward a General Theory using the Concept Time Horizon, pp. 1, 2.
9-ibid., p. 2.
10-Martineau, Social Classes and Spending Behavior, p. 129.
11-ibid., p. 129.
12-op. cit., #7, p. 9.
13-op. cit., #6, pp. 388-389.
14-op. cit., #6, p. 390.

Section 2
1-op. cit., Section I, #5, p. 25.
2-Meier, A Communications Theory of Urban Growth, p. 303.
4-Webber, Order in Diversity, p. 36.
5-ibid., p. 30.
6-op. cit., Section 2, #4, p. 49.
7-op. cit., Section 2, #4, p. 52.
8-Blumenfeld, The Modern Metropolis, p. 293.
9-ibid., p. 297.
10-Chapin, Urban Land Use Planning, p. 221.
11-Chapin, Activity Systems as Inputs to Land Use Models, p. 1.
12-ibid., p. 2.
13-op. cit., Section I, #6, p. 387.
15-op. cit., Section 2, #10, p. 223 (see also p. 225, p. 227).
16-op. cit., Section 1, #5, p. 5.
17-op. cit., Section 1, #5, p. 3.
18-op. cit., Section 2, #14, p. 16.
19-op. cit., Section 2, #3, pp. 90-130.

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Section 3
1-Sorokin, _Time Budgets of Human Behavior_, pp. 89-125.
2-op. cit., Section 2, #10, pp. 250-253.

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Section 4
1-Kleemeier, _Aging and Leisure_, pp. 158-159.
2-ibid., p. 163.
3-op. cit., Section 4, #1, p. 176.

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Appendix I
1-op. cit., Section I, #1, p. 1.
2-op. cit., Section I, #1, p. 7.
3-op. cit., Section I, #1, p. 7.
4-op. cit., Section 2, #14, p. 1.
5-op. cit., Section 2, #14, pp. 1-6.
7-op. cit., Section 2, #10, p. 78.
8-op. cit., Section I, #5, p. 10.
9-Banfield, _lecture_.
10-Roach, _The Lower Class, Status Frustration, and Social Disorganization_, p. 503.
11-ibid., p. 504.

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(no footnotes, Appendix II)
BIBLIOGRAPHY

Abbreviations:
'Amer Soc Review' -- American Sociological Review,
'Journal of Ab and Soc Psych' -- Journal of Abnormal and Social Psychology,
'Journal of Soc Psych' -- Journal of Social Psychology,
'American Journal of Psych' -- American Journal of Psychology,
'Journal of Exp Psych' -- Journal of Experimental Psychology,
'Journal of Gen. Psych' -- Journal of General Psychology,
'AIP' Journal' -- American Institute of Planners Journal,
(see below).


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________ and Wright, H.F.; Midwest and its Children, Harper and Row 1955 (N.Y.)


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