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SOCIAL INDICATORS: ACCIDENTS AND THE HOME ENVIRONMENT

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SOCIAL INDICATORS: ACCIDENTS AND THE HOME ENVIRONMENT

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PREFACE

Many students of governmental services have recently been caught up in the growing search for the purposes motivating the supply of those services. In recent years the experiments with PPBS have compelled a search for the goals underlying governmental programs. In turn, the disaffection with input-efficiency measures, such as work-load ratios and product standards, has compelled a search for the outputs of those programs. The efforts to implant planning processes have generated efforts to design monitors with capabilities of gauging conditions of the systems being planned. The growing concerns about environmental qualities have induced a quest for ways of identifying these qualities.

All these interlocked developments have served to reinforce the search for social indicators -- for measures that signal improvement or reduction in desired qualities or conditions. A group of graduate students at Berkeley have joined into that search, seeking to conceptualize the characteristics of desired qualities, and then to design measures that might be installed into governmental processes. Mr. Cassidy undertook an examination of the home environment, in an effort to measure the qualities of the home that public policy aims to foster. It quickly became clear, of course, that the desired qualities have never been identified -- that housing policy is directed to no explicit set of objectifiable aims.

He then explored the prospects of using accidents as a negative indicator of housing quality, suggesting that low rates of accidents may indicate comparatively good housing. This paper summarizes his findings and his conjectures. As a surrogate for more direct indicators of housing qualities, I find his idea highly suggestive and worthy of further examination. By making his working paper available to a wider community of researchers, we are hoping that others will take up the inquiry and pursue the prospects a step further.

Melvin M. Webber

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INTRODUCTION

This paper draws together two apparently disconnected topics: first, the search for ways of evaluating the quality of physical environment, and second, the use of accident statistics as social indicators. Each of these is covered separately, but the main focus will be on whether data on the incidence of home accidents can be used to indicate the quality of the home environment.

City planners have previously sought indicators of the quality of our physical environment by counting and trusting. They have counted quantities of physical facilities, rooms, toilets, square footage, and the like.¹ They have trusted the advocates of physical standards, who have provided an ideological basis for the use of measured divergence from standards as a guide to ameliorative policy. Mistakes, they now acknowledge, have been made in counting, and sufficient criticism has been levelled at the use of standards to undermine reliance on them.

It seems appropriate, in order to enlarge the focus of our search for a satisfactory substitute for standards, to include both the physical substance of environment and the people who use it. Once we have defined two obviously interdependent parts of a system, we can look for constraints on their interaction and then for measures of interaction

¹An Appraisal Method for Measuring the Quality of Housing. Parts 1,2,3. American Public Health Association: Committee on the Hygiene of Housing. New York, 1945.

within those constraints. In so doing we join the general trend towards measurement of performance by reference to outputs rather than to inputs.

Unfortunately a good theory about environmental constraints has not yet been developed. Most attempts to develop such a theory have themselves been constrained by avoidance of the most obvious limitations on interaction.² Little attention has been paid to the legal, political, and economic constraints on any activities undertaken; and the inadequacy of the remaining framework, within which a specific environment has been described in purely physical terms, is apparent. Yet it is just these constraints that generate the contexts for experience of and interaction with the physical environment. Previous studies have been slow to recognize that conflicting attitudes toward environment are influenced by non-physical factors, and quick to accept expressed attitudes toward the environment as really limited to that alone. The conflict of attitudes and expectations between people in different contextual relations with the environment -- employee compared with manager,³ owner compared with renter, user compared with passer-by -- clearly needs more explicit recognition and theoretical treatment.

In the absence of a satisfactory general theory of the way activities are constrained by legal and environmental conditions, might it not be interesting to look at a particular class of measurable

²Christopher Alexander. Notes on the Synthesis of Form, Cambridge, Mass. 1964.

David Canter. "Need for a Theory of Function in Architecture," Architects Journal, Feb. 4, 1970, pp. 249-302.

³The conflict is implicitly acknowledged in the long process of bargaining for "improved working conditions." What theory there is, is on behalf of the institutions' demands for increased efficiency, and employee comfort is only acknowledged as justifiable if it promotes efficiency.

interactions between environment and its users, namely those interactions which accidentally result in injury or death?

The existing uses of accident statistics as social indicators are considered in the next section. Following this we review, with reference to accident theories, what these statistics may be indicating. Environmental, social indicator and accident themes are then brought together in focusing upon home accident research. The paper concludes with a comment upon publicly available accident data.

I. ACCIDENTS AND INTERACTION

Accidents have long been recognized as a major cause of injury and death. Statistics are published by federal and local agencies, and most state and local health departments have some kind of accident-prevention bureau. In 1968, 28,500 deaths resulting from home accidents were recorded, in addition to 4,300,000 disabling injuries. This compares with 55,200 deaths and 2,000,000 disabling injuries caused by motor vehicles. Expressed as rates per 100,000 population, and per 100,000,000 miles traveled, both these figures, while alarming in quantity, represent dramatic improvements over figures for previous decades. Between 1912 and 1968, accidental home deaths per 100,000 population were reduced 50%, from 28 to 14.3. Between 1925 and 1968, motor vehicle accidental death rates per 100,000,000 vehicle miles dropped from 18 to 5. A minimum estimate of the costs of home accidents, excluding property damage, was \$1.6 billion in 1969.⁴

Accidents as Measures of System Integration

Stinchcombe, considering the problem of traffic accidents, establishes their importance as a system measure:

⁴Accident Facts 1969 Edition, National Safety Council, Chicago, 1969, pp. 40,80.

A traffic system has a very convenient characteristic for the theorist of social systems: when peoples' activities are not integrated in the system, they crash into each other. By counting the number of accidents, then, we get a very good measure of system integration.⁵

He goes on to develop a series of prescriptions for reducing accidents by modifications of the pathways, vehicles, and drivers whose interaction constitutes a traffic system.

An analogous set of prescriptions could be developed for the home environment system, recommending modifications of spaces which house activities, instruments used in the performance of these activities, and people undertaking them. However, we are less concerned here with these specific recommendations than with establishing accidents as a suitable measure of integration for our defined system.

At first glance, home activities and traffic systems seem far removed from each other. Yet each is capable of protecting or rejecting the unqualified (mothers protect their young by enclosure in play pens, drunk driving is illegal), each involves physical characteristics which are subject to some regulation by public agency (building codes and zoning ordinances, federal motor-vehicle safety regulations), and each involves activities learned by individuals (by habit, experience, and instruction manuals for special equipment in the home, by driver training for the road).

It would be most useful if we could modify one component of each system at a time and establish the effect upon our accident output measure. While this clearly could be achieved for the traffic system (for example, by monitoring accidents in cars with or without seat belts),

⁵ Arthur L. Stinchcombe, A Parsonian Theory of Traffic Accidents, Center for Planning and Development Research, University of California, Berkeley, May, 1966, p. 1.

no such clearcut experimental strategy seems available for housing, where changes of any general nature take a long time to diffuse.⁶

If accidents are accepted as a measure of system integration, can they also be used to indicate the quality of one component of that system? To answer affirmatively would be to claim consistency for the deterministic theories relating poor housing to high accident rates. As we shall see later, in several instances, such consistency does not exist. But to answer negatively would imply that only measures of systems performance are relevant, at least until the specific processes of interaction between components are much better understood. Indicators of the kind described here are as useful in suggesting the need for new theories as they are in confirming old ones.

Security and the Continuity of Human Needs

In current attempts to seek new measures of well-being -- e.g., measures of good mental and physical health to replace or complement traditional indicators of disease and malaise -- there is some danger that basic needs may be ignored or overlooked.⁷ The prevention of disease and accidents, safety or security in the broadest sense, joins

⁶ An exception to this might be provided by innovative mass housing, as proposed in HUD's Operation Breakthrough. A note on this proposes comparisons of the performance of "human-factored" mass produced homes, with traditional homes. See William J. Curran, Paul M. Denson, Sidney S. Lee: Operation Breakthrough: An Opportunity for a New Strategy in Consumer Protection. Harvard University School of Public Health, 1969.

⁷ There is a tendency for social caricatures to dominate discussion of national indicators, a presumption that a nation is homogeneously "Post-Industrial" for example. Rather, against a somewhat static continuum of needs, different activities, in different quantitative distributions among a population, become possible. See Raymond A. Bauer, ed. Social Indicators, MIT Press, 1966.

assurance of survival as a fundamental human need.⁸ Some continuum of human needs should be kept in mind, particularly when undertakings obviously indicative of well-being (recreational pursuits for example) bring with them risks of injury and death. For many, still, home is where security starts:

Housing as an element of material culture has as its prime purpose the provision of shelter, protection from potentially damaging or unpleasant trauma or other stimuli. The most primitive level of evaluation of housing, therefore, has to do with the question of how adequately it shelters the individuals who abide in it from threats in their environment.⁹

Housing standards address themselves to these issues, of course,¹⁰ but are insensitive to conditions which, though satisfying standards, increase risk. Any increased incidence of accidents in houses which meet standards would thus alert us to new environmental or behavioral hazards. But reduced incidence of accidents in houses not meeting standards would call into question the standards themselves.¹¹

Accidents as Indicators of Innovative Risk

The use of general accident data is clearly vital in alerting us to the dangers of activities. Privately owned airplanes, snowmobiles, and helicopters are examples of recent but now fairly widespread means of

⁸ Frank M. Stead, "Levels of Environmental Health", American Journal of Public Health, 50.3, 1960
Abraham H. Maslow, Toward a Psychology of Being (London: Van Nostrand, 1954).
WHO Expert Committee on Public Health Aspects of Housing, Technical Report #225 (Geneva: WHO, 1961).

⁹ Lee Rainwater, "Fear and the House as Haven in the Lower Class," in Journal of the American Institute of Planners, January 1966, pp. 23-31.

¹⁰ Basic Principles of Healthful Housing. American Public Health Association, Committee on the Hygiene of Housing, New York 2nd ed. 1950. Two of the four sections are concerned with protection, against contagion and against accidents.

¹¹ An enterprising tree-house, designed and built by a landscape architect in El Cerrito, California, was recently condemned by the local city for lack of a balustrade to a rope ladder, and a nearby commune was condemned for lack of off-street parking, despite the absence of any street.

transportation and recreation which bring with them particular hazards. The affluent home seems to need increasingly complicated appliances, garden and home recreation equipment. Since innovative machinery is rarely subject to severe regulation when it is first used we rely on feedback provided by such catch-all data sources as death certificates. Morbid though it may appear, watching how people die provides valuable indications of how they lived, of the risks they were prepared to take, and of unforeseen consequences of government and private decisions.¹²

Using a different approach, Starr has shown how differences between governmental and private willingness to undertake or sanction risky activities may be inferred from crude death rates. Dramatically, he shows that people will independently undertake riskier activities acting as private individuals than they would acting with governmental sanction.¹³ As more discretionary time is filled by recreation, at home or in the country, and more services are needed to extricate the injured, (from the home pool or from wilderness mountains)¹⁴, pressure for increased regulation will grow. The idea of a license to visit Yosemite or drive a lawnmower may be an anathema to freedom-loving Americans, but the delicate balance between the value of untrammelled liberty and the risks to society which it may cause is likely to be the subject of further debate.

¹²The Statistical Bulletin of the Metropolitan Life Insurance Company provides a regular commentary on these topics.

¹³Chauncey Starr, Social Benefit and Technological Risk. Symposium on Human Ecology, Warrenton, Virginia, November 1968.

¹⁴Daniel P. Webster, "Pool Drownings and their Prevention," HEW Public Health Reports, Vol. 82, No. 7, July 1967, pp.587-600.

Accidents as Measures of Preventive Jurisdictions

As suggested above there is considerable interest in accident prevention. But since the causes of accidents are incompletely understood, there is inevitable confusion about who is responsible for preventing which kinds of accidents. To prevent accidental poisoning, for example, should preventive efforts be concentrated on educating parents and children to recognize the hazards, on persuading drug manufacturers to label and package in a fool-proof way, or on insisting that local building codes demand lockable medicine cabinets in all homes? It would clearly be erroneous to attribute any improvement in ability to prevent accidents to one particular factor unless a rigorous experimental program had been devised.¹⁵

But we can happily regard the various preventive agencies as further components of the system, and, although unclear about precise jurisdictions, use accident statistics as measures of system performance. After all, what we hope for is adaptive change by each of the components, with a resulting overall improvement.

¹⁵Raymond Sobel, "Traditional Safety Measures and Accidental Poisonings in Childhood," Pediatrics, 1969, pp. 811-823.

II. THEORY OF ACCIDENTS

Accident statistics, then, unlike statistics for more obviously poverty-associated diseases like chronic lead poisoning, rat-borne diseases, and diseases directly related to poor sanitation, might indicate not only poor housing in a traditional sense, but also failures in behavioral competence and incompatibilities between activities undertaken and their enclosing environment.

But few studies consistently show correlation even between poor health in general and poor housing. A recent review points to the general inadequacy of epidemiologic bases for healthful housing standards, indicating a substantial retreat, at least within the medical profession, from the deterministic basis of housing standards and housing ordinances.

It has not been possible to invoke detailed epidemiologic arguments in establishing most principles and recommended standards for healthful housing or housing ordinances. Proposed appraisal methods and their modifications likewise are based more on socially accepted goals that should be economically obtainable . . . It should not be necessary to invoke health considerations in defense of improved environmental conditions among the poor.¹⁶

General Approaches

Although there is some agreement that accidents involve interaction between man and environment, accident literature abounds with contradictory theories of causation. At one extreme, the environment is held responsible, in part at least because evidence suggests that the

¹⁶ Joseph J. Harrington and Jonathan B. Weisbuch, "The Poverty/Disease Cycle: Environmental Factors," Harvard University School of Public Health, 1969.

only successes in accident prevention are due to technological, rather than psychological, interventions.

Trauma is directly related to technology. A very high proportion of the injuries of today could not have occurred a generation ago because the agents did not then exist . . . Although social and psychological factors are undoubtedly involved in the causal chain leading to accidental injury, this knowledge has not yet led to any great success in controlling the problem.¹⁷

At the other extreme, some psychiatrists regard accidents as subconsciously motivated events. When seen as individual cases, it is clear that most accidents are avoidable, and that injury results from a conscious or unconscious decision not to avoid them.¹⁸ The very avoidability of accidents distinguishes them from the consequences of traditional acts of God like earthquakes and floods (though a range of intermediate catastrophes are not so clearly categorized -- earth slides, and mine disasters for example).

Behavioral Approaches

Theoretical progress has been made by behavioral scientists working between these polar positions particularly in experimental psychology. Once we get used to the shocking neutrality of behaviorism, (one writer suggests that "injury is actually of interest only as an indicator that an accident may have happened")¹⁹, we find that

¹⁷ Reuel A. Stallones, "Epidemiological Considerations of the Health of Urban Communities," Center for Planning and Development Research, University of California, Berkeley, 1966.

¹⁸ Charles Brenner, An Elementary Textbook in Psychoanalysis, (New York: 1957), pp. 149-155. For a case history approach to automobile accidents see also: Charles Brenner, "Parapraxes and Wit," in Behavioral Approaches to Accident Research (New York: Association for Aid to Crippled Children, 1961).

¹⁹ Edward A. Suchman, "A Conceptual Analysis of the Accident Phenomena," in Behavioral Approaches to Accident Research, op. cit. p. 274.

regarding accidents as events enables us to separate the classes of contributing factors. Suchman suggests the following factors:²⁰

Predisposing Characteristics	Susceptible host Hazardous environment Injury producing agent
Situational Characteristics	Risk-taking Appraisal of hazard Margin of error
Accident Conditions	Unexpected Unavoidable Unintentional
Accident Effects	Injury Damage

By analyzing the processes of interaction and perception among these different factors, we begin to see points in the system structure where interventions might be successful. The system is clearly an adaptive one. Changes in hazards have to be accompanied by changes in perceptual skill in hazard identification if the system is to maintain itself, let alone improve. Further, inadequate reactions to perceptions which are themselves correct, will lead to accidents. It is clear that modifications of the environment which apparently make it safer pose new threats. When highways are improved, traffic can move faster. Rapoport wryly remarks on the possible tendency to maintain individual risk-taking at some constant level.²¹ To underline the uncertainty with which interventions are made, there has been much dispute about which traffic accident statistics would prove most persuasive in increasing driver care. (The consensus seems to be that the most pessimistic statistic, total deaths, or death rates per 100,000

²⁰ Edward A. Suchman, op. cit.

²¹ Anatol Rapoport, "Some Comments on Accident Research," in Behavioral Approaches to Accident Research, op. cit., pp. 164-178.

population, which have both increased -- although the latter only slightly since 1930 -- were preferable to the most logical, death rates per 100,000,000 miles travelled, which have decreased). Gibson's discussion of the margin of safety emphasizes the hazard perception problem.²² The margin of safety is something to be maintained, not maximized, and has both spatial and temporal dimensions, indicating closeness of danger in space, and imminence of danger in time. He classifies danger according to the kind of energy transfers involved: mechanical, thermal, radiant, chemical, and electrical.

These dangers can be extended in relation to childrens' accidents, where the mother's competence in understanding hazards on behalf of her child results in active accidents (those resulting from the child's own activity) while failures in competence result in passive accidents (those happening to the child, e.g. being dropped or struck). He identifies broad categories of background factors which predispose towards particular kinds of failure and hence accidents.²³

Rapaport remarks on the inconsistency of society's attitudes toward accidental injury and death. While we struggle valiantly and at enormous cost to save the nearly dead, we remain quite callous about accidents in general, the holiday highway death toll for example. The same pattern of irrationally allocated sensitivities toward suffering is clear in the disparate riches of different charitable organizations. In the United Kingdom, at least, appeals for blind are many times more successful than those for the deaf.

²²James J. Gibson, "The Contribution of Experimental Psychology to the Formulation of the Problem of Safety - A Brief for Basic Research," in Behavioral Approaches to Accident Research, op. cit., pp. 77-89.

²³Byron W. Wight, "The Control of Child-Environment Interactions: A Conceptual Approach to Accident Occurrence," Pediatrics, Vol. 44, No. 5, Part II, November 1969.

The message from the psychologists is clear: we should amplify or remove hazards, improve hazard recognition training, and increase individual awareness of the margin of safety for reaction time; but it is not easy to do this. For the time being, we may be justified in using accidents simply as system indicators, without too much concern for which particular causal chains were activated.

III. HOME ACCIDENTS

To investigate further the usefulness of accidents as indicators of environmental quality, we now review specific studies of home accidents, under the headings of the independent variables tested and reported in the literature.

Age, Sex, Race

Although figures for industrialized countries clearly show that risk of accidental home death is much higher for the very young and the very old than for other ages, (Figures 1,2,3,4) some important mysteries emerge. In the middle-age groups men have higher accident rates than women, although clearly not exposed to home hazards for the same length of time.²⁴ Studies of childhood home accidents show that race is a better predictor of major injury than socio-economic level; whites have higher rates for each category than non-whites.²⁵ However, the reverse is true for accidental deaths.²⁶

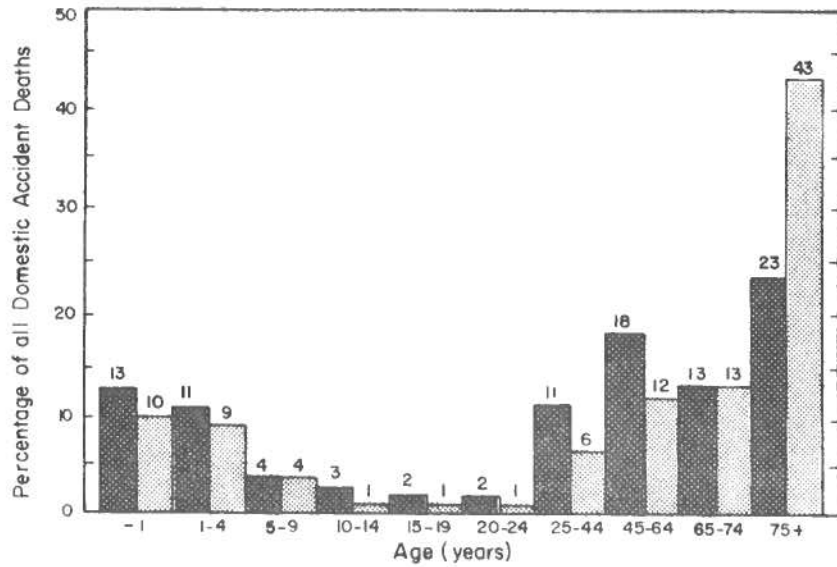
More recent attempts to relate specific socio-economic factors to classes of childhood accidents are promising theoretically, but call for detailed longitudinal study.²⁷

²⁴E. Maurice Backett, Domestic Accidents, (WHO: 1965) pp. 52 et sequ.

²⁵Dean I. Manheimer, Joanna Dewey, Glen D. Mellinger, Leslie Corsa, "50,000 Child Years of Accidental Injuries," Public Health Reports, Vol. 81, No. 6, June 1966, p. 522.

²⁶National Office of Vital Statistics: Accident Fatalities: U.S. and each State 1958, U.S. Government Printing Office (Washington, D.C.), Vol. 52, August 1960, pp. 177-208.

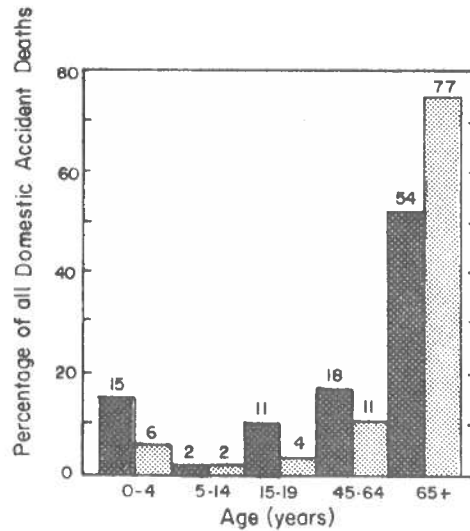
²⁷Wight, op. cit.



SOURCE: UNITED STATES DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE (1959)

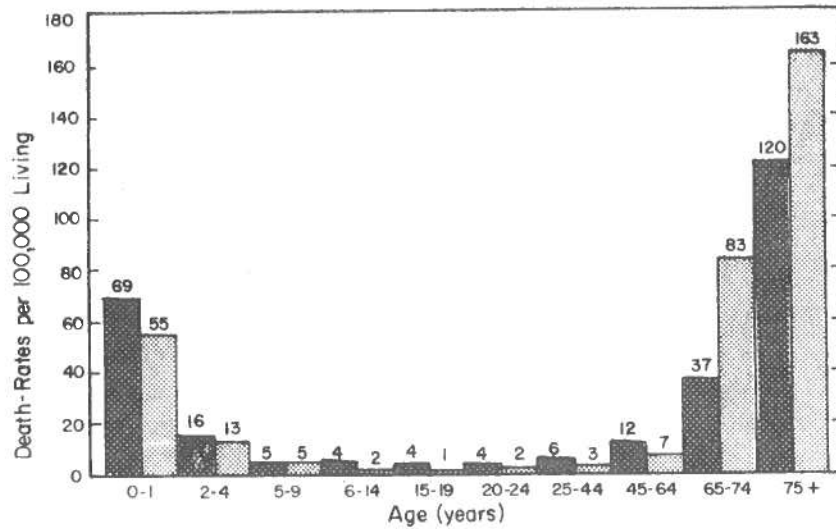
Figure 1: PROPORTIONATE DISTRIBUTION of FATAL DOMESTIC ACCIDENTS in the USA, in 1958, by AGE and SEX

■ Males
□ Females



SOURCE: ENGLAND AND WALES, REGISTRAR GENERAL (1962)

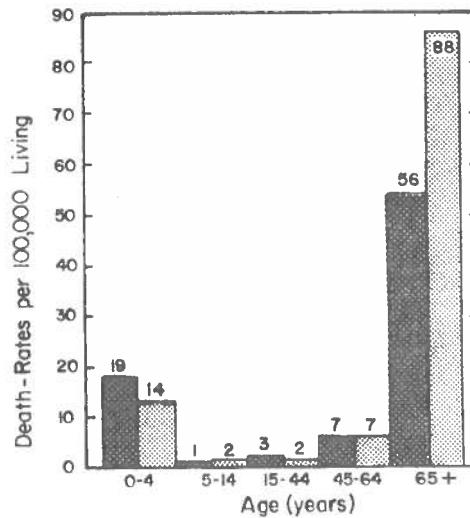
Figure 2: PROPORTIONATE DISTRIBUTION of FATAL DOMESTIC ACCIDENTS in ENGLAND and WALES, in 1960, by AGE and SEX



SOURCE: UNITED STATES, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
 * DATA BASED ON 22,749 DEATHS TO ACCIDENT IN AND AROUND THE HOME.

Figure 3: DISTRIBUTION of DOMESTIC ACCIDENT DEATH RATES PER 100,000 PERSONS in the USA, in 1958, by AGE and SEX *

■ Males
 ▨ Females



SOURCE: ENGLAND AND WALES, REGISTRAR-GENERAL (1962)

Figure 4: DISTRIBUTION of DOMESTIC ACCIDENT DEATH RATES PER 100,000 PERSONS in ENGLAND and WALES, in 1960, by AGE and SEX

TABLE I

MEDICALLY ATTENDED INJURIES BY FATHER'S OCCUPATION AND CHILD'S RACE --
ANNUAL RATES PER 1,000 CHILDREN FOR ALL INJURIES AND FOR SEVERE INJURIES

Father's occupation ¹	White			Negro			Oriental			All groups ²		
	Rates		Num-ber of chil-dren	Rates		Num-ber of chil-dren	Rates		Num-ber of chil-dren	Rates		Num-ber of chil-dren
	All in-juries	Se-vere in-juries		All in-juries	Se-vere in-juries		All in-juries	Se-vere in-juries		All in-juries	Se-vere in-juries	
Professional, technical, managerial.	276.9	41.4	2,335	236.5	27.8	95	149.1	20.5	161	268.1	39.7	2,601
Clerical, sales, skilled labor	260.0	40.4	2,462	181.6	27.9	514	168.0	20.0	137	244.7	37.6	3,154
Semiskilled and unskilled labor	256.6	42.0	696	193.3	33.0	1,018	134.8	20.5	72	216.8	36.9	1,861
Other: father deceased, not living with family, retired, occupation unknown.	262.7	39.2	841	190.9	28.2	249	133.0	8.1	34	234.7	35.3	1,258
All occupations.	267.6	40.5	6,334	189.7	29.3	1,876	149.4	19.4	404	246.1	37.4	8,874

¹At time of the child's enrollment in Kaiser Plan.

²Includes 250 children classified as "Other and Unknown."

Source: Dean I. Manheimer, et al, "50,000 Years of Accidental Injuries," Public Health Reports, Vol. 81, No. 6, June 1966, p. 522.

NOTE: Rates shown are standardized for age.

Social Class and Economic Status

Although MacQueen claims a direct association between number of home accidents among children and social class of father,²⁸ this claim is not supported in the Manheimer study (Table I).²⁹

Further, the national figures for the United States and the United Kingdom for fatal accidents to all age groups show very clear deviations from a model which equates accidents with low social class (Figures 5 and 6). What is it that makes professional men and their wives in the United Kingdom so much less competent than other classes in their homes? What generates identical accident rates for professional men and poor women in the United States? The United States figures are somewhat misleading, for when severity of accidents is taken into account (in terms of work days lost due to domestic accidents), the lower income group has higher accident rates than the others, (Figure 7). To complicate the picture the University of Michigan study showed no significant variation in rates for major injuries when related to income.³⁰

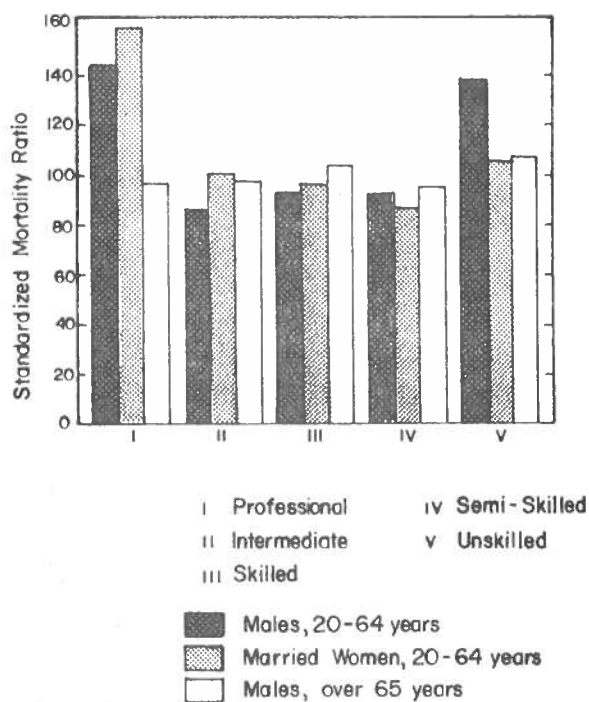
But California studies of nonfatal injuries show that, "contrary to popular belief, persons with family incomes over \$5000 per year appear to have significantly more accidents than those with lower incomes. The rates for the middle and lower income groups are similar."³¹

²⁸ I. A. G. MacQueen, A Study of Home Accidents in Aberdeen, (Edinburgh) 1950.

²⁹ Manheimer et al, op. cit.

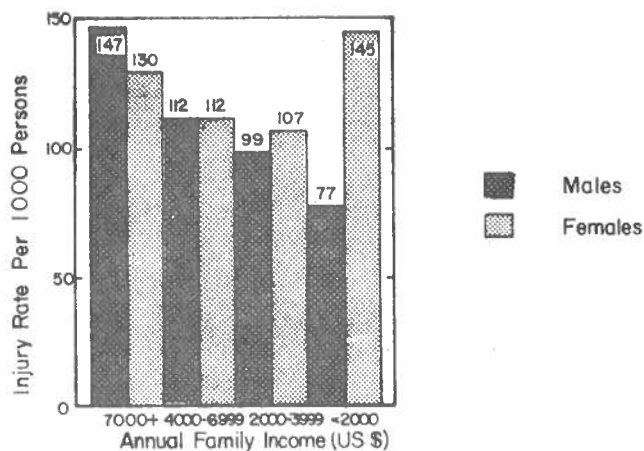
³⁰ School of Public Health, Home Injuries, (Ann Arbor: University of Michigan, 1953).

³¹ State of California, Department of Public Health, Home Safety Project, Final Report 1953-1957, Table 32, p. 141.



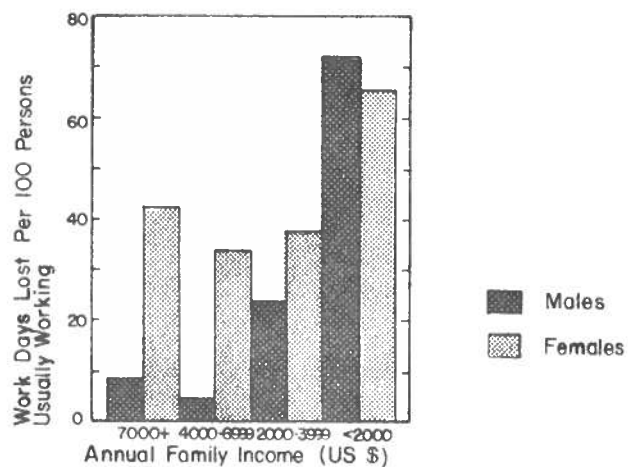
SOURCE: ENGLAND AND WALES, REGISTRAR GENERAL (1958)

Figure 5: DOMESTIC ACCIDENT MORTALITY in ENGLAND and WALES, in 1949-53, by SOCIAL CLASS: STANDARDIZED MORTALITY RATIOS for THREE GROUPS



SOURCE: UNITED STATES DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE (1959)

Figure 6: NUMBER INJURED in DOMESTIC ACCIDENTS PER PERSONS in the USA, in the YEARS 1957-58, by SEX and FAMILY INCOME



SOURCE : UNITED STATES DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE (1959)

* THAT IS, CAUSING INJURIES INVOLVING MEDICAL ATTENTION
OR RESTRICTING ACTIVITY FOR AT LEAST ONE WHOLE DAY

Figure 7: NUMBER of WORK-DAYS LOST OWING to SIGNIFICANT* DOMESTIC ACCIDENTS PER 100 PERSONS USUALLY WORKING, AGED 17 YEARS and OVER, in USA, in the YEAR 1957-58, by SEX and FAMILY

Housing Quality

If home accident incidence correlated with housing quality, or a conventional surrogate for quality like cost, valuation, or crowding, we could use accident statistics to indicate housing quality, despite our interaction hypothesis suggesting that there may not be strictly causal links. This would be a good deal more economical than the project-specific encyclopedic household surveys used today.

If, on the other hand, accidents were distributed unexpectedly across the spectrum of traditional quality measures, we would surely want to modify those measures. Thus "quality" would be extended to include some "freedom from unnecessary hazard" component.

There is evidence in the literature to support both hypotheses. Britten has shown the inverse relationship between a house-value/rent index and disabling home accidents: "Frequency of home accidents disabling for a week or longer increased as rental of dwelling went down"³² (Table II). A similar relationship was established between crowding (number of persons per room) and accidents. The frequency of all kinds of accidents declined as house values increased. This accident rate/ rental hypothesis has been confirmed elsewhere.³³ MacQueen found that all kinds of accidents were more frequent in households without basic domestic facilities.³⁴

These studies tend to confirm that, just as "quality of housing as judged by the amount of income or rental paid has been repeatedly

³²R. H. Britten and I. Altman, "Illness and Accidents Among Persons Living Under Different Housing Conditions," Public Health Reports, Vol. 56, March 1941, pp. 609-640.

³³HEW, "Accident Frequency: Place of Occurrence and Relation to Chronic Disease," Public Health Reports, 249, October 1953.

³⁴MacQueen, op. cit.

TABLE II
 TYPICAL RELATIONSHIP OF DISABLING HOME ACCIDENTS*
 BY MONTHLY RENTAL AND AGE**

Monthly Rental	Under 15	15-24	25-64	65 and over
Under 10	4.5	3.2	6.0	26.5
10 - 20	4.8	2.7	4.8	18.3
20 - 30	3.8	1.7	3.7	17.2
30 and over	3.0	1.7	3.5	11.1

Source: R. H. Britten and I. Altman.
 "Illness and Accidents Among
 Persons Living Under Different
 Housing Conditions," Public
 Health Reports, Vol. 50, 1941,
 pp. 609-640.

* More than one week during year.

** Rates per 100 persons for rental of
 multiple dwellings.

demonstrated as an influence on the frequency of both communicable and non-communicable disease . . . the same causative factors . . . are also a determining influence with accidents."³⁵ The incidence of accidents was one of the few variables in which Wilner's team found improvement when comparing experience in new Baltimore housing with that in an inner-city control group. Accidents to children under 10 years old were reduced by 50%, and general improvement was noted for the under-35 group.³⁶

But the situation is not so simple. Despite the usefulness of these findings to advocates of improved housing for the poor, other studies are beginning to show a different picture, hinted at in reference above to race-class and some of the income specific statistics. It is a picture which suggests that housing quality, measured not by cost but by the measure of interaction provided by accident statistics, needs urgent attention at all levels of well being. That accidents are not merely related to traditional conceptions of housing quality is suggested in the Michigan study which concludes that "programs of safety are important for all houses regardless of income . . . increased income does not mean decreased injuries."³⁷

The results of a household survey of accidental injuries, in Philadelphia, confirm this view.³⁸ Comparing major home accidents in

³⁵ John Gordon, "The Epidemiology of Accidents," American Journal of Public Health, Vol. 39, 1949, p. 525.

³⁶ Daniel Wilner, Rosabelle Price Walkley, Thomas C. Pinkerton, Matthew Taybeck, The Housing Environment and Family Life, (Johns Hopkins Press, 1962).

³⁷ University of Michigan, op. cit., p. 32.

³⁸ Community Health Services, Philadelphia Department of Public Health, Household Survey of Accidental Injuries, 1962.

District 1 (58% white, 42% nonwhite, crowded, center-city) with District 10 (99% white suburban development with detached housing), the following accident rates per 1000 people per annum were found.

District 1	male	57.7
	female	109.4
District 10	male	159.8
	female	192.8

Looking at the age breakdown, they found that for children 0-5 years old, the rates in District 10 were 790, in District 1, only 225.

Further, the results of relating accident rates and various measures of interior and exterior housekeeping are inconclusive. In District 10, the highest rates are in the "well kept" category, while in District 1 they are in the "very carelessly kept" category.

The study examines the relationship between tenure of household and accidents, giving the following rates for major home injuries per 1000 population per year.

		<u>Owned</u>	<u>Rented</u>
District 1	male	98	29
	female	82	123
District 10	male	158	160
	female	187	238

This confirms generally an expectation that rental accommodation is of a lower standard and that people care less about it than about property they own. The exception to this is the much higher accident rate for males in owned houses in the poorer district, "probably due to the owner working on the home to improve its quality."³⁹

³⁸Community Health Services, Philadelphia Department of Public Health, Household Survey of Accidental Injuries, 1962.

³⁹Philadelphia, op. cit., p. 44.

It is possible that these results were influenced by reporting predispositions, but the study seems to have been very thorough in its methods and checking procedures. Where reporting predispositions have been assessed, (by Manheimer et al, to test whether low black accident rates were a function of reporting) findings have been confirmed.⁴⁰

Although the major accident study in Philadelphia seems to be contradicted by a Santa Barbara study which found that suburban health districts were safest, conclusions are invalid because the data are not place-specific within each district (i.e. the poorest district also contains the recreation areas for all the other districts . . .).⁴¹

Other factors like regional location and urban-rural location have been considered. Substantial variation in accident rates in different locations is shown but no satisfactory explanations have been developed.⁴² Although important intervening variables like climate may be present, we can still use accident frequency as a measure of how well we adapt to climate.

We are left, then, with no consistent findings on the effect of housing quality on home accidents.

⁴⁰Maheimer, et al, op. cit., p. 531.

⁴¹The Santa Barbara Study. Home Safety Report, California Department of Health, pp. 104-131.

⁴²HEW, Vital Statistics: Special Reports, National Summaries, Vol. 52, No. 8, p. 177; and Metropolitan Life, Statistical Bulletin, Vol. 49, August 1966, p. 8.

IV. PUBLICLY AVAILABLE ACCIDENT DATA

In an attempt to further the investigation of housing quality and accidents without elaborate household surveys or access to hospital records a review was made of the 8500 death certificates held publicly in the Recorder's Office of Alameda County for the year 1960. Hospital records, like data on fires held by local fire departments, are becoming increasingly harder to get at in any suitable form: hospitals are interested in injury, insurance companies in cost; and readily available data which connect the place of injury with its severity are almost nonexistent. Only accidental deaths in homes were tabulated; accidental deaths in rest homes and hospitals were excluded as no appropriate valuation data are available from Census sources. An approximation of home value was calculated by using the average home valuation for the census tract in which the home address (where the accident occurred) was located. No differentiation was possible between home value and rental value since the death certificates do not indicate the tenure of household of the deceased. A resulting two-way tabulation, by age at death, and by approximate valuation of home, is shown in Table III.

Even without calculating a suitable denominator to establish rates for each partition, we can make some general observations. Falls dominate accidents for all age groups above 60; fires represent the greatest hazard to small children. Teenagers are noticeably accident-free; and, although accidents are a leading cause of death between ages 0-30,

Table 3: HOUSEHOLD DEATHS, ALAMEDA COUNTY 1960 by AGE and VALUATION of HOME

AGE AT DEATH	91-100								
		FI	FI FI FI FI AS	FI FI FI				FI FI	
	81-90		FI FI FI FI FI FI FI FI FI FI FI FI FI FI FI	FI FI FI FI	FI FI FI FI			FI FI	FI P
		FI FI FI	FI FI FI	FI FI FI FI					
	71-80	FI FI FI FI FI FI FI FI FI FI FI FI FI FI	FI FI FI FI FI FI FI FI B FI FI FI FI	FI FI	P B FI				
	61-70	F F P _o FI FI	FI FI FI P _o AS FI FI FI	FI P _o P _o	FI			FI	D B
	51-60	F F F FI	AI AI AI FI		D			AI	
		F							
41-50	F AS FI FI	D FI FI F AS		FI AI D					
31-40	F AS	FI P _o	F	D F			FI D		
21-30		G	AS	AS					
11-20	P								
0-10	FI FI D B B AS FI	P P _o F F F A A	F F F F FI	F P _o P _o					
		9-12	12-15	15-18	18-21	21-24	24-27	27-30	
		HOUSEHOLD VALUATION (\$000)							

Key:
 A auto-related*
 AI alcohol
 AS asphyxiation
 B burns
 D drugs
 F fire
 FI fall
 G gunshot
 P pool or bathtub
 P_o poison

SOURCE: DEATH CERTIFICATES, ALAMEDA COUNTY
 RECORDER'S OFFICE
 U.S. HOUSING CENSUS CALIFORNIA 1960

* auto related accidents include all those connected with use and maintenance of automobiles in the immediate vicinity of home

they are in fact quite few in number. Accidents of most kinds do occur in more expensive homes, but there are considerably fewer fires.

Preparation of accident rates per population at risk in each category on an annual basis would be useful. Then we could readily trace important changes. Using them, we could aid the various preventive agencies in identifying the most vulnerable groups, monitor agency performance in a systematic way, and remain alert to newly hazardous equipment, activities and home design.

V. CONCLUSION

It is clear that deterministic theories, relating low environmental quality (measured by traditional surrogates) with high accident rates, need major revision. Further study of accidents, behaviorally as events or systemically as performance measures, should seek to incorporate security as a critical function of the home. But before we can improve the home environment in guaranteed ways, the processes of interaction between man and environment, of which the frictional interaction evidenced by accidents is only one of many, need theoretical clarification.

Although we cannot use accident statistics to measure traditional kinds of home quality, we can use them to test the assumptions upon which belief in those traditional qualities is based.