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ABSTRACT

The relationship between the rate of social change and the incidence of mental disorder was analyzed for a 10 percent regional sample of U.S. counties (N=279) with a non-metropolitan status as of 1950. Data collected in 1950, 1960, and 1970 were derived from the Censuses of Government, Manufacturers, and Population, as well as from Vital Statistics and other government documents. State agencies were surveyed for data on the incidence of mental disorder. Variables under study were changes in: (1) median family income; (2) income inequality; (3) median education; (4) manufacturing (initial status vs post industry); (5) occupations (percent of residents employed in agriculture and percent self and (6) rate of mental disorder. It was theorized that alterations in these dimensions and (6) rate of mental disorder. It was theorized that alternations in these dimensions imply a basic realignment of social patterns and habits with an increased potential for social disorganization and pathology. Analysis indicated that changes, self-employment excepted, were conducive to increased levels of mental disorder in rural areas. These structural changes, especially in the area of occupational change, were found to be "powerfully" related to changes in manufacturing; however, it was surmised that since interpretation of social change is difficult at best, the relationship between industry and mental disorder is less than simple. (JC)

CENTER OF APPLIED SOCIOLOGY

University of Wisconsin - Madison

NONMETROPOLITAN INDUSTRIAL LOCATION AND THE INCIDENCE OF MENTAL DISORDER

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Working Paper RID 75.8

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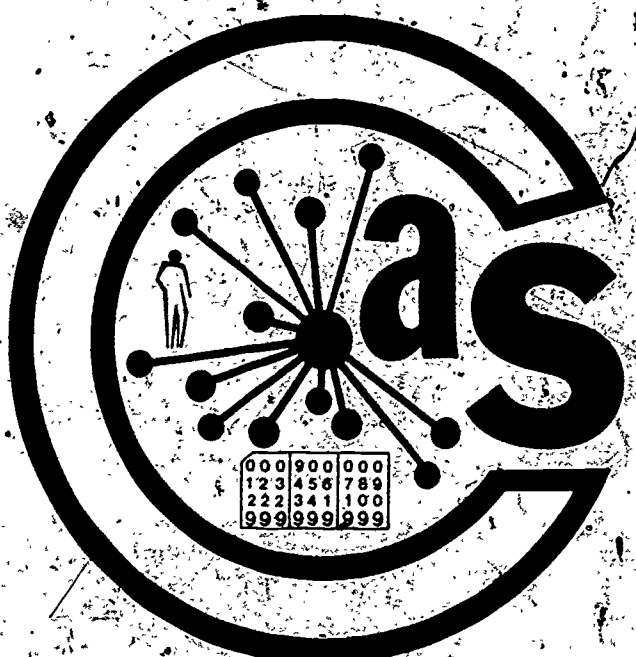

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population. Industrialization is likely to cause greater changes on an Indian reservation than a suburb of a large city. Likewise, the demands made by industry may be more difficult to accommodate for the reservation than the suburb.[2]

The question is what are these demands and what are the ramifications of inducing change into the existing order? In a rural community with a mainly agricultural economy, one might expect the skill level to be relatively low. What one would probably find is a preponderance of farmers, farm laborers, and farm related business activities (for example, cooperatives, equipment companies, and feed, seed and supply dealers). The introduction of industry necessarily changes this arrangement to allow for the diversity of activities found in a manufacturing plant. The usual effect of this accommodation is a decline in agricultural activities in favor of a movement toward manufacturing employment (Andrews, et al., 1959; Andrews and Bauder, 1968; Beck and Summers, 1973). Wilbert Moore (1966) has also considered the effects of industrialization on the occupational structure. Some of the changes that he notes are a general movement from agricultural to industrial activities, a specialization of work activities, the upgrading of skill categories and an increase of the proportion of wage and salary workers. These changes are not surprising considering the increased diversity of employment opportunities requiring new and perhaps more advanced levels of skill. Even more importantly is that these positions offer a chance for higher social position and an improved life style. One finding is that there is an increase in per capita and consumer income associated

population. Industrialization is likely to cause greater changes on an Indian reservation than a suburb of a large city. Likewise, the demands made by industry may be more difficult to accommodate for the reservation than the suburb.[2]

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with industrialization (Andrews, et al., 1959; Kuznets, 1960, 1963).

The trend toward differentiation and specialization in the occupational structure has implications for changes in other dimensions of the social structure. One important change is found in a shift of emphasis from ascribed to achieved status (Smelser and Lipset, 1966). Ascriptive status is the status bequeathed to one as result of social origins regardless of individual abilities (Svalastoga, 1965). The effect of this is to enhance the importance of the family and traditional institutions to the individual as a source of social status. However, for individuals or groups low on ascribed status, the importance of these institutions may be less dear; or they may remain important for intrinsic reasons. Nevertheless, it may be less difficult for these low status groups to make the transition from ascribed to achieved status because they have comparatively less to lose (Zaltman, 1973).

As a community becomes more specialized, the process of social differentiation leads to additional roles and statuses for a population to move within which heretofore had been relatively stable. The additional roles make available new opportunities to alter the social position of groups or individuals leading to a time of flux and change within the previously stable order. The significance of these changes for non-metropolitan American life are easily surmised. In a rural area where one source of status may have been from the association with family wealth in the form of a farm or small business or the social position of the family in the community, the introduction of industry opens new possibilities for achievement among propertyless individuals as well as

perhaps discounting the importance of traditional status symbols. A new set of statuses are introduced that may compete or supercede older statuses associated with family prestige or wealth. The distinction between "new money" and "old money" can be seen as an attempt to preserve status differences along traditional lines (Warner, 1963).

An important element in achieved status is the dimension of education. In communities where achievement is the main source of status, education serves as an important means of raising one's position in the social structure (Svalastoga, 1965; Blau and Duncan, 1966; Sewell and Hauser, 1975). It is not unreasonable to expect that as the emphasis is shifted toward achieved status and ascribed status becomes even less important, the necessity of education will lead to gains in the educational level of the population.

The differentiation of occupational activities and the increased levels of skill necessary for industrial employment means that for a rural community to participate in these activities, it is necessary that additional schooling over and above that necessary for farm activities be secured. However, this is not the only way that industry influences the educational level in a community. Another factor is that a community oriented more toward industry has less need for child labor. Therefore, children are more likely to stay in school longer than if they were needed to work in the fields (Treiman, 1970). Hoselitz notes that changes in the institutional order (e.g. education) and skilled workers are necessary for the development of industry. Additionally, increasing education and a widening distribution of education implies that some persons will be disadvantaged and possibly displaced as a community becomes oriented toward industrial pursuits and the necessary skills to perform them. Educational attainment is

an advantage to those who possess it and a disadvantage to those who do not. This point has broader implications for the effective maintenance of social order and organization. An example is when a farm labor force, displaced by industry and unable to secure industrial employment in any large scale, must turn to the state for aid and assistance or migrate to other areas. For those unable to migrate, public assistance may be the only alternative.

The transition and disintegration of traditional social relations also means changes in the institutional arrangements of the community. Where once, family, friends, and neighbors played a central role in community welfare and control, industrialization and its concomitant effects often produce changes that render primary groups ineffective. The result is that specialized formal organizations now assume duties previously performed by informal groups. This change has been characterized as a "shift in the locus of control". (Smelser and Lipset, 1966). The professional firefighter replaces the volunteer fireman, the welfare agency replaces family and friends, and more importantly for this paper, the mental hospital replaces the family in assuming responsibility for persons of untoward character.

In summary, the introduction of industry to a rural community makes for several kinds of change. Perhaps the most important is the differentiation of social relations. The new positions afforded by industrial location opens new possibilities for achievement of statuses and a new manner of living. These changes may be facilitated through changes in the occupational structure, the income structure, the rising importance of education, or through a new system of values that rearrange the order by which persons classify themselves.

Thus far, we have dealt with a number of outgrowths that are the result of industrial location in rural areas. What has not been dealt with

is the ultimate consequences that these changes have for the organization and order of the community. There appears to be a dearth of information for the assessment of the "human" costs of industrial location. The majority of studies that make some attempt to determine the effect that industrial location on the quality of life attend to variables like community participation; satisfaction with local industry and so forth. Other studies have concerned themselves with the effects that particular variables have on aspects of the social structure. Without explicitly dealing with the phenomena, this latter group of studies often deals with constructs that may be directly related to industrial location. For example, the independent variables in these studies are frequently changing levels of income, education, mobility, community growth, and occupational structure which have been shown, by other studies, to be related to the location of industry. It seems particularly important to discover how these variables are linked to industrial location and what relationship they have with various social pathologies in order to better understand the human "costs" of industry.

II. The Social Structure and Social Order.

The subject of this research is the incidence of mental disorder among local residents and the factors that contribute to this rate. Before discussing the literature relevant to this topic, it is perhaps best that some attention be given to the concept of mental disorder as it is used here.

For the purposes of this paper, mental disorder is used to operationalize the concept of community organization. One should note that aggregate measures, i.e. rates of incidence of mental disorder are used rather than measures of the mental disturbance of individuals. The concern of this

research is not with an epidemeological study of personal disturbance but rather with the meaning that rates of mental disorder have for the community as a whole.[1] The significance of these rates is nested within the assumption that well ordered communities have relatively low rates of disorder whereas less cohesive communities with relatively unstable social relations will exhibit higher rates of disturbance. It might be argued that a community may have relatively high rates of mental disorder yet remain cohesive enough to care for these individuals so that they would not appear in the measurement of rates (would not be hospitalized). Or, the community might become so disorganized that no heed is paid to the mentally imbalanced and again do not show up in the measurement of rates.

To the first of these queries, an assumption of this study is that the mental hospital tends to be a place of last resort when all else fails. Therefore, when traditional means of coping with untoward behavior such as sanctions from family, friends, and peers fail or are unavailable, it becomes the job of the mental hospital to correct or control such conduct. To the latter argument, it may be the case that in areas of intense disorganization, the mentally disturbed are never detected nor inducted for care. Yet in the communities used for this study, (non-metropolitan United States counties, 1950-1970), it is highly doubtful that this is the case.

In some cases, the road to the mental hospital is through the criminal justice system, but even here to escape one's crime via the asylum other bizarre behaviors must be exhibited in the form of violating informal codes of behaving to corroborate one's insanity. It may well be that there are many different types of social disorganization in both the formal and informal spheres of control. A society whose formally ordered political

structure (for example, a coalition government) has broken down may be able to keep informal organization such as the family or clan structure intact. This is often the case in developing countries where the future of political organization is frequently more tenuous and unstable than traditional family and tribal structures. The opposite could be said of many western industrialized nations. The preservation of informal normative relations is a much greater problem evidenced by the numerous formal organizations designed to assume such responsibilities. The welfare agency is a classic example. Studies of modernization and technological change in developing societies has noted that one effect of "westernization" is a shift in the "locus of control" or importance from informal to formal institutions. (Smelser and Lipset, 1966)[3]. This means that as a society becomes increasingly rationalized, many of the functions previously performed by informal groups are now assumed by formally organized institutions designed for the performance of specialized tasks.

Several studies have been addressed to the effects of structural change on the social relations of the community. In an investigation of the relationship between several types of mental disorder and community growth, Wechsler (1961) found a positive association for depressive disorders and community growth. His explanation of the phenomena was that stable communities with close interpersonal relations foster interdependency, will exhibit high rates of depression when rapid change threatens to alter their social organization. Another study of several types of communities found the highest rate of mental disorder in a rapidly growing suburban county. (Gordon and Gordon, 1960). Although they do not precisely define a "rapidly growing suburb" nor is the probable source of

growth indicated, it is possible that its growth was due to industrial location. It has been found that a process of growth is usually associated with industry location in rural areas. (Merrill and Ryther, 1961; Stuart, 1971; Summers, et al, 1975).

In a study of the rates of mental disorder by admissions to public mental hospitals, Brenner (1973) discovered a strong negative association for admissions to public mental hospitals and manufacturing employment; he chose to call the latter "the economy". This means that changes in manufacturing employment and possibly related changes in dimensions such as income will have an effect on the rate of mental disorder in the community. Depending on the direction of change, the effect may retard or accelerate incidence rates. Perhaps more interesting is the fact that he found that the relationship obtained for both organic and functional disorders. His explanation of this is that in difficult economic conditions, traditional methods of caring (e.g. the family) for a senile, retarded, or alcoholic family member tend to break down because of additional financial and/or psychological burdens created by economic problems. If Brenner is correct, the thorny problem of separating admissions by diagnosis becomes superfluous for the study of social disorganization. This is so because one might expect changes in all categories of admissions rather than in any single one.

Brenner's work covers only one aspect of social disintegration; fluctuations in the economy or manufacturing employment. James Coleman has approached this problem more generally and offers a theoretical explanation for the process of societal disorganization (1961). He discusses two trends toward disorganization; first is the specialization of locality.

By this, he means that as a community becomes increasingly diversified, there is a tendency toward fragmentation and mobility. Some of the results of this trend are that children and parents affiliate less, local institutions have a lessening importance in community life, and there is an increased dependence on mass communication. The interdependency of community social relations becomes tenuous as social differentiation increases.

Paraphrasing Coleman's theory, to place it in the perspective of this research, industrialization creates and diversifies the number of available occupational and social roles. This differentiation and specialization tends to reduce the number of common interests in the community thereby reducing the number of social relationships and mutual ties. This creates a net reduction of interests in community life and a lessening importance of primary relations as a source of mutual aid, sanctions and referents of behavior. When this occurs, formal institutions such as the mental hospital, assume the responsibility for uncontrollable individuals. The history and development of the mental hospital has been largely the result of attempting to cope with deviant behavior in a society growing ever larger and impersonal (Rothman, 1971). It also may be that one reason that the individual becomes uncontrollable is that sanctions and referents of behavior are unavailable or superfluous in a relatively atomistic society.

The second trend that Coleman describes refers to the transition from a set of comparatively traditional norms and behaviors to a more rational way of doing things. Rapid social change, introduced by industry, may make old norms and behaviors useless and hence new courses of action must be improvised and developed. Coleman states that:

> "since the industrial revolution, new changes have followed quickly previous ones. Such continual change tends to keep community organization at a low level - for the existing norms, customs, and authority structure are undergoing continual erosion, as they become irrelevant for the new conditions."[8](p. 594).

Thus, there may arise a lack of community consensus about what is proper, leading to a breakdown in social relations. This can be seen in small college towns where there is a breach between the older residents adhering to "traditional" standards of propriety and "progressive" students. There is also an implicitly psychological facet of the absence of behavioral signposts; that it is stressful. Thus a void of social norms, of itself, might be expected to generate mental imbalance. However, this is not to imply that this study will be able to test such an idea regarding either the causes of psychological stress or the effects of normlessness. This is presented as one possible explanation for what is occurring on the level of analysis below the one on which we are working.

To briefly summarize, one might expect that the industrialization of rural communities will introduce salient changes in the social structure. There changes will be most discernable in the distribution of income, occupations and education. Therefore, the expectation is that changes in these dimensions, caused by industrial location, will in some measure be disruptive of the social relations of the community. The extent to which these disrupted relations become dysfunctional and disintegrated should be reflected in the level of local mental disorder; in this case, first admissions to public mental hospitals. This in some measure should give an indication of the "costs" of industrial location in human terms. Much has been said of the effects of industrial location on the social structure and what effects that structural characteristics have on social

pathologies but what are the linkages between these sets of variables? Hopefully, this study and the analysis to follow will provide a first estimation.

The design of this study does not allow any strict extrapolation to an individual level of analysis so we are limited to making inferences at only the level of the community. However, other research has given a clue to the possible composition of rates of mental disturbance; though they have small bearing on this research because of differences in the levels of analysis.

A review by Bean, Bonjean, and Burton (1974) relates that changes in social mobility results in mental illness, the weakening of family ties and cohesion, manifest anxiety, psychosomatic symptoms and decreased social participation. They also noted that another line of research has not found these effects but tend to emphasize the positive benefits of social mobility. Their own research found that alienation is an inverse function of mobility but they were not prepared to conclude that mobility has no adverse effects.

The implication of this research is that structural changes somehow affect the social relations in the community. When mobility rates within an area increase, then this increase in the rate is certain to have some effect on the local residents at a personal level. The design of this study does not allow a strict extrapolation that would say that individual mobility is disruptive of the social networks at a community level. However, one can speculate that large wholesale changes in the social structure as a result of industrialization is likely to create such phenomena at the individual level. Research into the effects of mobility on individuals

gives some clue to what is occurring when one observes the relationship between mental disorder, manufacturing, and changes in the social structure. This becomes more clear when one considers the finding that rural industrial location often provides a means of upward mobility by creating job opportunities that provide a higher income level, changes for achieving a higher occupational status, and employment for the younger, better educated portion of the population that are most likely to become upwardly mobile (Andrews, et. al., 1959; Andrews and Bauder, 1968; Brinkman, 1973).

Overconformity, lower levels of family cohesion and a belief in an open class structure have also been described as consequences of mobility (Tumin, 1967). In an empirical test of the effects of occupational mobility, it was found that upward mobility tends to produce a decreasing level of participation in primary group relations (Kessin, 1971). The author adds that mobility has its greatest effect where mobility is infrequent or where more than one stratum is crossed.

In a more general study, perceived social change was found to be linked with psychological stress (Lauer, 1974). In this study, subjects were asked to assess the rate of social change and were then tested for social stress. The results showed a complicated relationship where the effect of change depended on the perceived rate of change and the perceived desirability of change.

III. Method.

The data were collected from a ten percent regional sample of United States counties with a non-metropolitan status in 1950 giving a total N of 279. From this total, it was necessary to remove three of the counties

from the sample because in two cases, "independent cities" were formed within county boundaries making it impossible to secure comparable data at the city and county level. It was necessary to eliminate a third county because it held an SMSA status in 1950 and was included in the sample by mistake. Altogether, this means that there is a non-response error in the initial sample of approximately one percent.

The sources of data are several. Most of the data were collected at three points in time, 1950, 1960, and 1970 from the Censuses of Government, Manufacturers and Population as well as the Vital Statistics and other government documents. The problem of sampling error within such sources tends to be minimal but it occasionally creates problems. For example, it was necessary to eliminate a fourth county that appeared as an extreme outlying value. This was for the percentage of self-employed workers in the labor force where a value of 128% was observed. The source of error seems to be in the sampling procedures used by the Census of Population. For the occupational characteristics of the population, a 20% sample was drawn and then inflated to meet population proportions. In this instance, more self-employed workers were reported than were members of the labor force. No other cases like this appeared in the data used for analysis and hopefully, this is an isolated instance.

The data on the incidence of mental disorder was gathered by surveying state agencies in charge of maintaining statistics on mental health care. It was not possible to secure data on the incidence of mental disorder for every county in the sample. In some cases, it was necessary to use the fiscal year instead of the calendar year and in other cases, a proximal year was used as a surrogate. In no instance was a proximal year used if

if were more than three years from the time of the data collection. For some counties, the necessary records were not kept and the data is simply unavailable. In sum, the total available data for 1960 is 54.5% and for 1970, 75.1% of the data are present.

Since the emphasis of this paper is on the process of social change, the independent variables are indicative of change from one time to another. However, independent mental disorder is measured as an absolute level. The rationale for this is that we are concerned with how much mental disorder is generated by certain kinds of social change rather than how much change is created in the rate of mental disturbance by changes in the social structure. Thus, the social structure variables are for change from 1950 to 1960, 1960 to 1970 and 1950 to 1970 which are given by the differences: (I) (1960 - 1950), (II) (1970-1960), (III) (1970-1950). It might be argued that the time lags are too long to effectively measure the effect of social change. Yet Brenner (1973) found the optimum time lag to be seven to eleven years. Moreover, in some counties, the change will be rapid and early in the decade; in others, the change will come late in the decade. In still others, the change may occur evenly, either slowly or rapidly, across the ten years. With these variations in change, it seems prudent to assert a process of randomization for the possibilities of change and assume the expected lag for the ten year periods as five years (the mid-point) and ten years for the twenty year lag. This is not to say that the actual lag periods are five and ten years but instead are the average or expected lag times.

There are several methods used to measure the changes in the dimensions of education, income, and occupation. To study changes in education, variations in the median education of males and of females are used as

the operational indicators. Variations in the local income structure are indicated by two measures. The first is change in median family income and the second is change in the Gini coefficient of income concentration. Changes in the median family income show how absolute levels of family income vary over time whereas the Gini coefficient is indicative of changes in income shares within the county, a measure of income inequality. It has been pointed out that Gini coefficients tend to be deceptive of "real" changes in income inequality in terms of buying power. (Haller, 1970). The problem appears to be that these coefficients underestimate or hide the degree to which inequality exists. For example, an apparent small gain at the lower income levels would amount to a much larger gain in consumable income at the higher income levels under the assumption of a constant Gini coefficient. With due consideration to this problem, it might be argued that since the Gini is an underestimate, it is also a conservative estimate. Therefore, whatever changes do occur, it may be that income inequalities are actually greater and large changes in the Gini most certainly reflect large changes in income inequality.

Two major effects of industry on the occupational structure of rural areas is the shift away from agricultural activities and the bureaucratization of the labor force. (Moore, 1966). By bureaucratization, Moore means that there is an increase in the number of wage and salary workers. To measure these changes, variations in the percent of the labor force in agriculture, forestry, and fishery industries and the percent of the labor force that is self-employed are used to gauge the shifts in these dimensions.

IV. The Model.

In the measurement of social change, it has been pointed out that

it is important to account for initial status as a determinate of potential change (Wiley and Harnischfeger, 1973; Blalock, 1969). X_1 represents the initial status of manufacturing prior to the treatment of time.

Figure 1. about here

Initial status was not included throughout the model since change in the endogenous variables are directly or indirectly linked to change in manufacturing, X_2, they are also indirectly linked to the initial status of manufacturing. Hence, the inclusion of initial status for each variable would lead to an inefficient and redundant model because change in the endogenous variables is in some sense connected with change in manufacturing and by extension, with the initial level of manufacturing[4]. By including X_1, some of the initial status is explained for all the variables.

X_3 is the Gini coefficient of income concentration at the time of initial observation. It was indicated earlier that social change (in this case, technological change examplified by change in manufacturing) is more easily accomplished where resistance to change and adherence to traditional values are low. That is, in the relative absence of elites who tend to cling to traditional values and often exercise a great deal of social and political power. Therefore, one would expect that an area with large inequalities in income, giving an indication of the presence of elites, would be more resistant to the location of manufacturing and potential social changes than an area with a population of relative equals. The exception to this might be in the case of the existence of business elites who might attempt to induce industrial location in order to bolster the local economy.

An important result of industrial location is the effect that it has on the labor force; particularly with respect to shifts from agriculture and to bureaucratized forms of employment. X_4 represents the change in the percent of residents employed in agriculture, forestry and fishery industry. It is expected that changes, especially large positive ones will mean a decline or negative gain in this variable. Similarly, positive changes in the level of manufacturing may produce like changes in the percent of the residents who are self-employed (X_5). The marginal businessman or the subsistence farmer, who by definition are both self-employed, may take the opportunity to become more securely occupied in a relatively stable manufacturing firm. However, studies have shown that industry also brings economic gains to retail enterprise (Andrews and Bauder, 1968) so it may well be that industrial location will have a greater effect on the decline of agricultural, forestry and fishery industries than on the self-employed population as a whole.

Needless to say, changes in the occupational structure of a community mean changes in other characteristics of the social structure. It has been shown that industrialization often means a positive gain in consumer income (Andrews, et. al., 1959; Kuznets, 1960, 1963; Brinkman, 1973). The measure of this gain or change in income is X_6; the change in median family income. The larger the changes in the level of manufacturing (percent of the labor force in durable and non-durable manufacturing industries, X_2) the greater the gains that will occur in median family income.

A related result of increases in median family income might be changes in the distribution of income. The introduction of industry means additional opportunity for upward mobility for segments of the population that may have

been forced to either out-migrate or remain in relatively low status positions. Additionally, the explicit position of the federal government in offering subsidies for rural industrial location is to provide employment opportunities to traditionally disadvantaged groups although the effectiveness of this approach seems doubtful (Summers, et. al., 1975). However, what might be expected is that the expansion of employment opportunities and the rise of family incomes will lead to a decline in income inequality yet the extent of this decline is uncertain. X_7 is the change in the Gini coefficient of income concentration.

The Gini coefficient (also called the Gini concentration ratio) is given by the formula:

$$Gi = \left(\sum_{i=1}^{n} X_i Y_{i+1}\right) - \left(\sum_{i=1}^{n} X_{i+1} Y_i\right)$$

where Y_i is the cumulative percentage of income shares and X_i is the cumulative percentage of the population. This statistic is a measure of the area between the diagonal of cartesian coordinates and a line described by a Lorenz curve (Shyrock and Siegel, 1973). Therefore, the smaller the coefficient, the more equally that income is distributed. The postulate is that positive changes in manufacturing will reduce the inequality of income and, therefore, is negatively related to the Gini coefficient and tends to create negative gains in income inequality.

A third result may occur where changes in the occupational structure produce changes in the level of education in the population. Specialized jobs in manufacturing necessitate higher levels of skill and the competition for these occupations might be expected to raise the level of education in the community. This may occur through in-migration, incentives for school completion, or even adult education. X_8 is the median education

for males or for females (see figure title). It is recognized that median education is not a direct measure of skill levels (for example it does not take account of job experience or job training. However, it is one aspect of skill which is easily measured and quantified.

Lastly, X_9 is the rate of mental disorder measured by the rate of incidence per 1000 population. The rate of mental disturbance is the result of the direct and indirect effects of the variables X_1 through X_8. The direct effect of manufacturing probably will be small since much of its effect is mediated through the intervening variables X_4 through X_8. X_1 and X_3 are indirectly causally related to mental disorder insofar as they are the variables of initial status which predetermine the amount of change in manufacturing and begin the causal chain that results in a weakening of the social order.

X_4 and X_5 are both directly and indirectly related to mental disorder. The shifts in the occupational structure from farm to non-farm activities and from employer to employee means a rearrangement of lives, changes of behavior patterns, attitudes and most importantly, the establishment of a new network of social relations. This is the direct effect that these variables have on the social pathology of a community. Indirectly, changes in the occupational structure affects mental disorder by forcing a rearrangement of some of the basic characteristics of the social structure that may have a weakening effect on social relations.

The basic characteristics under study here are changes in median family income, income inequality and median education. These variables are affected directly by changes in manufacturing and by changes in the occupational structure. In turn, they directly affect the rate of mental disorder.

Changes in education, income, and income distribution along with changes in the occupational structure are changes that affect the core of the social structure and the pattern of social relations. Alterations in these dimensions imply a basic realignment of social patterns and habits with an increased potential for social disorganization and pathology.

The coefficients used in this model are standardized path coefficients derived from the basic theorem of path analysis (Duncan, 1966):

$$r_{ij} = \sum_{k}^{n} p_{ik} r_{kj}$$

The structural equations for the model are the following:

$$X_2 = p_{21}X_1 + p_{23}X_3 + p_{2a}a$$

$$X_4 = p_{41}X_1 + p_{42}X_2 + p_{43}X_3 + p_{4b}b$$

$$X_5 = p_{51}X_1 + p_{52}X_2 + p_{53}X_3 + p_{5c}c$$

$$X_6 = p_{61}X_1 + p_{62}X_2 + p_{63}X_3 + p_{64}X_4 + p_{65}X_5 + p_{6d}d$$

$$X_7 = p_{71}X_1 + p_{72}X_2 + p_{73}X_3 + p_{74}X_4 + p_{75}X_5 + p_{7e}e$$

$$X_8 = p_{81}X_1 + p_{82}X_2 + p_{83}X_3 + p_{84}X_4 + p_{85}X_5 + p_{8f}f$$

$$X_9 = p_{91}X_1 + p_{92}X_2 + p_{93}X_3 + p_{94}X_4 + p_{95}X_5 + p_{96}X_6 + p_{97}X_7 + p_{98}X_8 + p_{9g}g$$

V. Findings.

The structural equation showing the effects of the level of manufacturing and of income concentration on change in the percent of the resident labor force employed in manufacturing is:

$X_2 = -.095X_1 + .185X_3$ for 1950 to 1960

$X_2 = .099X_1 + .508X_3$ for 1960 to 1970 and

$X_2 = -.058X_1 + .412X_3$ for 1950 to 1970.

Changes in the level of manufacturing appear to be only slightly effected by the initial amount of industrial activity. The results are further confounded by changes in the sign of the coefficients yet it seems safe to say that the small size of the coefficients renders such shifts relatively meaningless.

The effects of income concentration on changes in the level of manufacturing are somewhat more clear. The positive signs of the coefficients indicate that the more that income is concentrated, that is, more unequally distributed, the greater will be the change in manufacturing activity. This tends to violate the original assumption concentrations of elites would attempt to discourage industrial location. Of course, there was the alternative explanation that elites, especially business elites, might attempt to encourage industrial location for the benefits that might accrue to the local economy. However, a third explanation is apparent in the pattern exhibited by the path coefficients. The decade of 1950 to 1960 shows a relatively small value (.185) while the decade 1960 to 1970 gives a much larger term (.508). Considering the government programs of the 1960's designed to assist areas with concentrations of low incomes this result is not surprising. Areas with large numbers of

low income persons are more likely to become targets for industrial location because of government subsidies offered to firms to locate in such areas.

The next set of variables in the causal chain are changes in the occupational structure indicated by changing levels of self-employment and of the resident labor force in agriculture, forestry and fishery.

Beginning with X_4, changes in the percent of the labor force in agriculture, forestry and fishery, the structural equations are:

$X_4 = -.061X_1 - .487X_2 - .551X_3$ for 1950 to 1960.

$X_4 = .020X_1 - .228X_2 - .563X_3$ for 1960 to 1970.

$X_4 = .077X_1 - .473X_2 - .496X_3$ for 1950 to 1970.

This again shows that the initial status of manufacturing is relatively unimportant as a determinant of social change.

However, the level of income concentration again appears as a significant factor in changes in agricultural, forestry and fishery activity. The negative signs of the coefficients can be interpreted to mean that the more that income is equally distributed, the more change there will be in extractive industries. But there is another consideration to be taken account of. This is the nature of the change we are speaking of; whether change means declines, gains or both. It is difficult to answer this question definitively since some counties may show gains and others will show declines yet a clue to the general nature of change is given by the mean of all changes. The percent of the resident labor force in agriculture, forestry and fishery had an average decline of 13.23% for 1950 to 1960 and 8.83% for 1960 to 1970.

Assuming that change is in the negative direction, it can be said that the more equally that income is distributed, the greater the decline

in agriculture, forestry and fishery. One probable reason for this is that an equal income distribution precludes the existence of large holdings by a small group of individuals. This leaves a group of small, marginal operators who are more likely to be bankrupted or to change occupations.

A caveat must be added to this interpretation. In this case, a mean or expected change is used to translate the meaning of the slope of a regression line which is not unlike using oranges to describe apples. A more strict interpretation is simply that unequal distributions of income tends to discourage changes in agriculture activities. In this instance, the expected change is a decline.

Keeping this in mind, the other major determinant of changes in agriculture, forestry and fishery (henceforth referred to as agriculture) is changes in the percent of the resident labor force in manufacturing. Large positive changes in the level of manufacturing produce small changes in agricultural activity. One interpretation might be that the increase of manufacturing retards the decline of agriculture.

However, put in the context of other research (Beck and Summers, 1973) it may be that industry retards the growth of agriculture. It was found that in one county experiencing industrial growth, a decline in agriculture resulted while similar non-industrialized counties experienced growth in the agricultural sector. The interpretation of "change" variables is more than perplexing but previous research and common sense would tend to support the proposition that positive changes in manufacturing is a deterrent to agriculture.

The other dimension of changes in the occupational structure is the change in the resident labor force who are self-employed. Examining the

means, we find that the changes in this group are not nearly as dramatic as those in agriculture. In the decade of 1950 to 1960, there was a mean decline of 6.9% among self-employed residents. However, the decline in 1960 to 1970 is only .537%, one half of one percent. One probable reason for this miniscule decline in 1960 to 1970 is that the definition of self-employed worker was re-defined by the Census Bureau in 1970.

Accordingly, the path coefficients for 1950 to 1960 are much more powerful than the coefficients for 1960 to 1970. Unfortunately, the differences between these coefficients are probably more artifactual than real; however, the signs are both negative. The structural equations for changes in the percent of the self-employed labor force are:

$X_5 = -.104X_1 - .370X_2 - .500X_3$ for 1950 to 1960.

$X_5 = -.464X_1 - .040X_2 + .350X_3$ for 1960 to 1970 and,

$X_5 = -.326X_1 - .360X_2 - .455X_3$ for 1950 to 1970.

Much of the same interpretation given to the results for changes in agriculture might be also given for changes in self-employment.

Large inequalities in the distribution of income tends to produce small changes in the number of self-employed residents. One possible reason for this relation is that an area with a largely unequal income distribution may have fewer self-employed persons available for occupational changes. The converse is that a community with many local entrepreneurs will be more equal in terms of wealth and will also have more opportunities to lose and gain persons in the self-employed sector of the labor force.

It was argued that changes in the level of manufacturing may actually retard the growth of agriculture rather than stem the decline of employment opportunities. Since the size and sign of the coefficients of the change

in manufacturing on agriculture and on self-employment are much the same, the same argument might also be made for the relationship between changes in self-employment and changing levels of manufacturing. Other research (Beck and Summers, 1973) also supports this conclusion. The finding was that wage and salary workers increased in the industrialized area whereas the opposite was true in non-industrial control areas.

The initial status of the level of manufacturing appears to be much more strongly related to changes in self-employment than to changes in agricultural activity. The inverse relationship of the percent of residents in manufacturing with changes in the percent of self-employed residents means that low levels of manufacturing activity are likely to result in greater amounts of change among the self-employed. A further interpretation is that areas with low levels of manufacturing are more likely to have greater numbers of self-employed residents available for shifts in occupation and vice versa.

Flowing from the changes in the occupational structure are changes in median family income (X_6), changes in the gini coefficient of income concentration (X_7) and changes in median education (X_8). The structural equations for changes in median family income are:

$$X_6 = .281X_1 - .126X_2 - .414X_3 - .106X_4 - .013X_5 \text{ for 1950 to 1960,}$$

$$X_6 = .317X_1 + .057X_2 - .341X_3 - .143X_4 + .082X_5 \text{ for 1960 to 1970 and,}$$

$$X_6 = .278X_1 + .018X_2 - .327X_3 + .290X_4 - .206X_5 \text{ for 1950 to 1970.}$$

The shifting values and signs of the coefficients make interpretation of the results somewhat confusing. One probable explanation for these shaky results is that they are the product of particular historical conditions affecting the economy and median family income and also from long run trends (such as inflation). These factors tend to minimize the importance of some

variables in one decade and maximize them in another.

One particularly stable relationship is between median family income and the level of manufacturing. The result is a positive relation which is in accordance with what was expected. The greater the level of manufacturing, the larger the change in median family income. The more involved that a community is in manufacturing, the greater the possibility of unionization or cost of living raises to avoid unionization. Therefore, not only does manufacturing bring higher wages but it also produces changes in family earnings faster than in lesser industrialized counties.

The Gini coefficient of income concentration is also stably related to changes in median family income; however the relationship is an inverse one. This simply says that the more unequal the distribution of income, the less likely there are to be any changes in family earnings. The coefficient for 1960 to 1970 is somewhat less than the term for 1950 to 1960. It is possible that this is due to programs developed to alleviate poverty and thus, the original distribution of income had less to do with changes in family income in 60 to 70 than 50 to 60.

The two decades of 50 to 60 and 60 to 70 had relatively stable coefficients for the relationship between the occupational structure and median family income. There is a negative association between changes in median family income and changes in the percent of the labor force in agriculture. This may be due to small and middle sized operators who are forced out of business by economic conditions and must take a decrease in income prior to the failure of their operation and while changing occupations. This is one possibility but there is no hard evidence to support this assertion. In the long run, it turns out that changes in agriculture is a profitable experience insofar as the coefficient for the period of 1950 to 1970

is positive .290. Thus, over a longer period of time, changes in agricultural activities lead to like changes in median family income.

The effect of changes in self-employment over each of the two decades on family income appear negligible. It may be that the ten year period is not sufficient time for such changes to have an effect since the coefficient for changes in self-employment over the twenty years (1950-1970) is much more substantial (-.206). This indicates that changes in self-employment are inversely associated with family income. A stable occupational structure is more likely to produce changes in median family income and what was said earlier about changes in agriculture and changes in family income are also applicable here.

The instability of the coefficients for changes in manufacturing and changes in family income make any interpretation difficult. It might be said that in 1950 to 1960, the negative association shows a kind of marginal relationship between family income and changes in manufacturing. Large shifts in industry tend to produce smaller shifts in family income because of the lower income positions in secondary and tertiary activities that accompany large industrial growth. The opposite is true when industrial location is slight and the associated change in family earnings is greater.The relationship does not appear to hold for 1960 to 1970 or 1950 to 1970. In fact, the coefficients are so small, the influence they exert is negligible.

Another measure of change in income is the change in the Gini coefficient of income concentration. This is a measure of the change in the concentration of income created by shifts in the occupational structure which in turn have been produced by changes in manufacturing. The

estimated structural equations for changes in the Gini are:

$$X_7 = -.249X_1 + .191X_2 - .401X_3 + .143X_4 - .037X_5 \text{ for 1950 to 1960,}$$

$$X_7 = -.231X_1 - .146X_2 - .637X_3 - .343X_4 + .061X_5 \text{ for 1960 to 1970 and,}$$

$$X_7 = -.232X_1 - .162X_2 - .781X_3 - .256X_4 + .167X_5 \text{ for 1950 to 1970.}$$

Again, the same instability in the coefficients appears over time for perhaps the same reasons that affected changes in median family income. The strongest effect on changes in the Gini coefficient is not, surprisingly, the original status of income concentration. The relationship is such that large inequalities in the distribution of income tend to discourage changes in the Gini over time.

Another fairly stable association is between the percent of the resident labor force in manufacturing and changes in the Gini. The negative relationship between these variables indicates that small numbers in the percent of the labor force in manufacturing is likely to produce large changes in the concentration of income. Conversely, a high level of manufacturing is not likely to produce large changes in income inequality. One indication of why this is so is given by the zero-order correlation between the level of manufacturing and the Gini coefficient. In 1950, the correlation is -.268 and -.240 in 1960; or the more manufacturing, the more equally income will be distributed. Therefore, an area with a large amount of manufacturing is likely to have a relatively equal income distribution which will disallow any great changes in the dispersion of wealth.

The coefficients for the effect of changes in self-employment on changes in the Gini are small and unstable in sign. Because of their small size, however, the switch of sign is not especially disconcerting. In fact, it appears that the ten year (five year time lag) period is not sufficient to allow the association. This is clear after looking at the

twenty-year period which gives a larger coefficient of .167. This shows that changes in the percent of self-employed residents makes a contribution to changes in the distribution of income albeit a small one. It might also be noted that the expected change in the income distribution is toward a more equal arrangement. The Gini coefficient showed a mean decline of .013 from 1950 to 1960 and .010 from 1960 to 1970. Therefore, the expected declines in self-employment might also be expected to establish a more equal income distribution.

Changes in the level of manufacturing and changes in agriculture yield coefficients whose behavior is quite difficult to interpret. In the decade of 1950 to 1960, both variables show a positive relationship with changes in the Gini coefficient yet in 1950 to 1970, and 1960 to 1970, the association does an about face and becomes negatively related. The reasons for this are difficult to establish; perhaps particular historical conditions, changing census procedures or measurement error are responsible. It is sufficient to say that in 1950 to 1960, changes in manufacturing and in agriculture were positively associated with changes in the distribution of income. In the next decade and over the entire twenty year period of study, large changes in agriculture and in manufacturing resulted in only modest alterations of the income distribution. One could speculate why this is so but the apparent unreliability of the parameters makes it a risky business and probably not worthwhile.

The last important intervening variable netween manufacturing and mental disorder is the change in median education for males or for females (X_8, see figure title). For males, the structural equations are:

$X_{8m} = -.028X_1 - .380X_2 - .110X_3 - .195X_4 + .014X_5$ for 1950 to 1960,

$X_{8m} = .039X_1 - .121X_2 - .071X_3 + .146X_4 - .163X_5$ for 1960 to 1970, and

$X_{8m} = .015X_1 - .411X_2 + .059X_3 + .295X_4 - .368X_5$ for 1950 to 1970.

The structural equations for the median education of females are:

$X_{8f} = -.019X_1 - .213X_2 + .101X_3 - .101X_4 + .023X_5$ for 1950 to 1960,

$X_{8f} = .244X_1 - .090X_2 + .274X_3 - .040X_4 + .085X_5$ for 1960 to 1970 and,

$X_{8f} = .161X_1 - .217X_2 + .232X_3 + .008X_4 + .011X_5$ for 1950 to 1970.

Contrary to expectation, the effects of the level of manufacturing has only a modest effect on the educational level of males while its contribution to the median education of females is somewhat more substantial. Among males, the size of the coefficients is relatively stable yet for females, the level of manufacturing had hardly no effect in 1950 to 1960 but was more potent in 1960 to 1970. The data give no indication why this is so; perhaps this is reflective of the rapidly changing role of women in society.

In 1950 to 1960, changing levels of manufacturing had a substantial impact on the median education of both men and women. But unexpectedly, the relationship is such that the more change one finds in manufacturing, the less change there will be in education. One possible reason for this is that the majority of industry located in the sample is non-durable (paper, textiles, food processing, etc.) The level of skill necessary for these jobs is low, unskilled and semi-skilled; lower than that necessary for durable industry. Thus, non-durable manufacturing opens opportunities for the lowly educated and offers no incentives to those in school to complete their education. The net result of this is to lower the educational level of the entire community. Other research has come to similar conclusions (Thompson and Matilla, 1973).

The contribution that the concentration of income makes to median education is not clear, especially for females. In the decade 1950 to 1960, the association is negative and not especially powerful for either men or

women. The interpretation of this could simply be that the more income is concentrated, the less change there will be in median education. This may owe to the fact that a highly concentrated income distribution probably indicates a large number of low income persons with fewer opportunities for education.

In the decade 1960 to 1970, the association further deteriorates with respect to men , yet for women the relationship reverses sign and becomes stronger. Could it be that the emphasis on education for women became stronger among the wealthy in 1960 to 1970?

As expected, the effects of changes in the occupational structure are much stronger for men than for women. In fact, such changes have almost no effect on women's educational level. However for men this is not true.

In 1950 to 1960, the most substantial change in the occupational structure was changes in the percent of residents in agriculture. The contribution of changes in the self-employed resident labor force is negligible in this decade. Moreover, the association between changes in agriculture and changes in the median education of males is negative. This means that small changes in agriculture will result in large changes in education.

This is not the case in 1960 to 1970 when large changes in agriculture are expected to produce large changes in education. Since the change in agriculture is probably a decline and the change in education an increase, it is not unlikely that as predicted, declines in agriculture brought on by manufacturing result in gains in the educational level of men. This also appears to be true over the long run since the strongest association was positive over the twenty year period.

The long range effect of changes in self-employment appears to have a

retarding effect on changes in median education. Why this is so is not clear. It may be that shifts to and from bureaucratized labor has some effect on the educational aspirations and attainment of community residents but the data do not allow further investigation of this problem.

What all of this has been leading to is an investigation of the effects of industrial location on the social structure and ultimately its effect on social disorganization indicated by the incidence of mental disorder. Using the median education of males as X_8, the structural equations used to estimate the effects of social change on mental disorder are:

$X_9 = -.036X_3 + .251X_4 - .137X_5 + .291X_6 + .182X_7 + .030X_8$ for 1950 to 1960,

$X_9 = -.041X_3 + .198X_4 - .192X_5 + .213X_6 + .063X_7 + .001X_8$ for 1960 to 1970, and

$X_9 = -.018X_3 + .232X_4 - .224X_5 + .197X_6 + .139X_7 + .031X_8$ for 1950 to 1970.

Using the median education of females for X_8, the structural equations are:

$X_9 = -.059X_3 + .240X_4 - .134X_5 + .319X_6 + .156X_7 - .084X_8$ for 1950 to 1960,

$X_9 = -.044X_3 + .198X_4 - .192X_5 + .213X_6 + .063X_7 - .055X_8$ for 1960 to 1970, and

$X_9 = -.058X_3 + .223X_4 - .231X_5 + .218X_6 + .124X_7 - .079X_8$ for 1950 to 1970.

Inspection of the equations show that the resulting relationships are remarkable stable over time and, except for small changes in the numbers, reliable between males and females. The effects of changes in manufacturing are negative but are so small as to be negligible. This was expected since

much of the explained variance in mental disorder is attributable to changes in other dimensions. One dimension,however, that does not appear to be especially important is median education.

The relationship between the incidence of mental disorder and the median education of males is positive so that changes in the median education of males increase the likelihood of the incidence of mental disorder. The opposite is true for changes in the median education of females. Nevertheless the size of the coefficients are so small as to have only a modest, if any, effect.

The two most important variables contributing to the incidence of mental disorder are changes in the resident labor force in agriculture and changes in median family income. The association between mental disorder and changes in family income and with changes in agriculture is positive so that these shifts are quite conducive to the incidence of mental disorder.

Another variable that makes a contribution to the social disorganization of the community is changes in the distribution of income. Shifts in the concentration of income are positively related to the incidence of mental disorder. The larger the changes in the distribution of income, the larger the changes in the rate of mental disorder.

Contrary to expectation, mental disorder is negatively related to changes in the self-employed resident labor force. Any explanation of this phenomena is precluded by the nature of the data. It may be that some measure of security is afforded by working for stable wages or salaries that are not obtained through living by one's wits.

In summary, changes in the social structure, with the exception of changes in self-employment, are conducive to increasing the level of mental

disorder in the community. These structural changes, especially in the occupational structure, are powerfully related to changes in manufacturing and other pre-existing social conditions. Yet because of the difficulty in interpreting the meaning and nature of social change, the total effects of manufacturing are not as clear as might be hoped for and the relationship between manufacturing and mental disorder is not a simple one.

VI. Conclusion.

Perhaps the best of all worlds for policy makers and others who must make decisions about the need or necessity of industrial location would be a dollars and cents analysis of the human costs of manufacturing experience. This kind of presentation would render a black and white explication of what is good and what is bad about industrial location in rural areas; much like comparing prices in a supermarket. However, human social life is not so simple as to be readily presented in black and white and the social analyst is often case into the position of comparing nearly identical shades of gray; trying to say which is lighter and which is darker.

Some of the benefits likely to accrue from the location of industry are a more equitable income distribution, an increased family income, and possibly increased job opportunities, although the latter is less certain (Summers, et. al., 1975). These are benefits that arise because some of the most basic characteristics in the social structure are changed, most notably in the occupational composition of the community.

These are also the most easily identified and agreed upon sorts of benefits because they are easily cast into a money equals better life perspective. Perhaps one reason that up until the present the benefits

of industrial location have been much touted while discussion of the disadvantages has been neglected is that the benefits are more easily set into dollars and cents while many of the disadvantages are not.

One such disadvantage is the disorganizing effect that industrial location poses for the rural community. Changes in the occupational structure is one result of industrial location that is strongly related to the incidence of mental disorder. Why this is so might entail an in-depth social psychological study that takes account of the effects of changes at both the societal and especially the individual level of analysis.

Changes in the occupational composition of a community may occur from local residents shifting from one sector to another or from an influx of in-migrants looking for new kinds of employment offered by industry. In the former, the increase in mental disorder might arise from actual shifts and adjustments necessary to move from one kind of employment to another. This seems especially difficult for those in agricultural employment but in any event, this is just the opposite for people in self-employment. In the latter instance, the process of inmigration may in itself be a disorganizing process with the introduction of new individuals without any strong attachment to their new community or residence.

Changes in the occupational structure are not the only kinds of changes that contribute to the incidence of mental disorder. Changes in the median family income and in the Gini coefficient of income distribution were also found to be positively related to mental disorder. Also, the median education of males but to a much lesser extent. The expected changes in family income and income distribution is toward an increase in family income and a more equal distribution of income. This is an anomalous finding since we find a decided benefit creating a disadvantage.

The greater the increases in family income and in equality of the income distribution, the higher the level of mental disorder. The problem is how do we choose between the two alternatives? Again, we return to the basic assumption that more money, more equality equals a better way of life. The purpose of this discussion is not to argue against this assumption but rather to make the point that the quality of life is not entirely measurable in terms of dollars and cents. As we have seen, one way of improving the standard of living has ramifications for other, less obvious and less measurable, dimensions of the quality of life.

This is not to say unequivocally that industrial location should be avoided because of its disorganizing impact. Rather, it seems quite possible that industrial location could be accomplished with a minimum of disruption to the social relations of the community. Of necessity, this action requires planning, careful study and close monitoring. Also, close consideration of the social composition of the community must be taken into account. For example, some industries locating on or near Indian reservations have found that absenteeism becomes much less of a problem after organizing production around elements of Indian culture such as ceremonies, holidays, etc.

The relationship between the industry and the community can be a cooperative one. Marx chose to emphasize the antagonism between factory owners and factory workers mainly because the organization of the factory was exploitative and existed only for the benefit of the owners. There are perhaps still such similar relationships between communities and manufacturers. Communities that go to great expense to accomodate industry and receive nothing in return are an example. But this need not be the case. Rather, the close and cautious accounting of the costs of

industrialization in both financial and human terms can make the arrangement profitable for the industry, the workers and the community as a whole.

Finally, this study has served as only a beginning for the assessment of the effects of industry in non-monetary terms. As a beginning, many important considerations and variables have been omitted. Variables such as population growth, in-migration, dispersion in the distribution of education might also be very important as agents of disorganization. In addition, it probably would be useful to understand the relationship that other variables of disorganization such as divorce, suicide and homicide have with a changing social structure and with themselves. After this, perhaps we can be more secure in our statements, pro and con, about the human costs of industrial location.

FOOTNOTES

1. An account of early ideas (17th century) about the nature of mental disorder can be found in Michel Foucault's Madness and Civilization, (1965).

2. An assumption of this paper is that the mental hospital is as much an institution of containment as a place of rehabilitation. Even so, rehabilitation can be seen as a form of control since it is designed to eliminate undesirable behaviors by teaching the individual self-control. Nevertheless, the mental hospital has often been equally, if not more concerned with custodial care than with a rehabilitation to return the individual to society. This point is discussed in detail in David J. Rothman's Discovery of the Asylum (1971).

3. Much of the work concerning the effects of [redacted]dustrialization has come from studies of under-developed or dev[redacted]ping countries; the so-called "modernization" literature. The objects of study for this research are rural American communities or more properly, counties. It should be apparent that much of the modernization literature is not entirely applicable to the present investigation, especially in detail. However, many of the findings seem general enough that it would be a mistake to dismiss them simply because of their location.

TABLE 1. ZERO ORDER CORRELATION MATRIX FOR THE DECADE OF 1950 TO 1960

	MFG 50	GIN 50	CMG 65	CAG 65	CSE 65	CMI 65	CG 65	CEM 65	CEF 65	MD 60
MFG 50	1.000									
GIN 50	- .268	1.000								
CMG 65	- .144	.210	1.000							
CAG 65	.157	- .637	- .594	1.000						
CSE 65	.083	- .550	- .460	.749	1.000					
CMI 65	.395	- .465	- .197	.287	.243	1.000				
CG 65	- .150	- .365	.075	.218	.182	- .454	1.000			
CEM 65	.027	- .066	- .290	.107	.101	.412	- .288	1.000		
CEF 65	.025	- .089	- .182	.104	.099	.251	- .166	.303	1.000	
MD 60	.231	- .251	- .176	.292	.171	.275	.049	.126	- .007	1.000

MFG 50: Percent of residents in manufacturing, 1950
GIN 50: Gini coefficient of income concentration, 1950
CMG 65: Change in the percent of residents in mfg.
CAG 65: Change in the percent of residents in agriculture, forestry and fishery.
CSE 65: Change in the percent of residents self-employed
CMI 65: Change in median family income
CG 65: Change in the Gini coefficient of income concentration
CEM 65: Change in the median education of males
CEF 65: Change in the median education of females
MD 60: Incidence of mental disorder per 1000 population, 1960

TABLE 2. ZERO ORDER CORRELATION MATRIX FOR THE DECADE OF 1960 TO 1970

	MFG 60	GIN 60	CMG 76	CAG 76	CSE 76	CMI 76	CG 76	CEM 76	CEF 76	MD 60
MFG 60	1.000									
GIN 60	- .240	1.000								
CMG 76	- .023	.484	1.000							
CAG 76	.160	- .678	- .501	1.000						
CSE 76	- .379	- .258	- .199	.345	1.000					
CMI 76	.343	- .313	- .060	.138	- .011	1.000				
CG 76	- .103	- .645	- .444	.455	.330	- .189	1.000			
CEM 76	.144	- .196	- .197	.205	- .085	.334	.074	1.000		
CEF 76	.148	.150	.027	- .094	- .067	.184	- .135	.336	1.000	
MD 60	.115	- .201	- .147	.217	- .093	.223	.076	.140	- .031	1.000

MFG 60: Percent of residents in manufacturing, 1960
GIN 60: Gini coefficient of income concentration, 1960
CMG 76: Change in the percent of residents in manufacturing
CAG 76: Change in the percent of residents in agriculture, forestry, fishery
CSE 76: Change in the percent of residents self-employed
CMI 76: Change in median family income
CG 76: Change in the Gini coefficient of income concentration
CEM 76: Change in the median education of males
CEF 76: Change in the median education of females
MD 60: Incidence of mental disorder per 1000 population, 1960

TABLE 3. ZERO ORDER CORRELATION MATRIX FOR THE DECADES OF 1950 TO 1970

	MFG 50	GIN 50	CMG 75	CAG 75	CSE 75	CMI 75	CG 75	CEM 75	CEF 75	MD 70
MFG 50	1.000									
GIN 50	- .268	1.000								
CMG 75	- .168	.427	1.000							
CAG 75	.289	- .719	- .698	1.000						
CSE 75	- .144	- .521	- .499	.650	1.000					
CMI 75	.476	- .495	- .268	.459	.104	1.000				
CG 75	- .094	- .691	- .361	.460	.522	- .063	1.000			
CEM 75	.207	- .141	- .411	.305	- .004	.408	- .067	1.000		
CEF 75	.136	.085	- .156	.046	- .020	.175	- .125	.399	1.000	
MD 70	.182	- .226	- .184	.263	.029	.289	.121	.181	- .033	1.000

MFG 50: Percent of residents in manufacturing, 1950
GIN 50: Gini coefficient of income concentration, 1950
CMG 75: Change in the percent of residents in manufacturing
CAG 75: Change in the percent of residents in agriculture, forestry and fishery
CSE 75: Change in the percent of residents self-employed
CMI 75: Change in median family income
CG 75: Change in the Gini coefficient of income concentration
CEM 75: Change in the median education of males
CEF 75: Change in the median education of females
MD 70: Incidence of mental disorder per 1000 population, 1970

TABLE 4. MEANS AND STANDARD DEVIATIONS FOR 1950 TO 1960, 1960 TO 1970 AND 1950 TO 1970
See Legend for Variable Description

	1950-1960		1960-1970		1950-1970	
	$\bar{X}$	s.d.	$\bar{X}$	s.d.	$\bar{X}$	s.d.
X_1	13.35%	10.92	16.89%	11.32	*	*
X_2	3.54%	4.93	3.98%	6.34	7.52%	8.84
X_3	.406	.056	.392	.053	*	*
X_4	-13.23%	8.17	- 8.83%	7.47	-22.06%	13.00
X_5	- 6.90%	6.76	- .537%	7.94	- 7.44%	11.5
X_6	$1824.30	620.84	$3138.40	702.71	$4963.10	1033.6
X_7	- .013	.030	- .010	.031	- .023	.036
(males) X_8	.759 yrs.	.604	1.47 yrs.	.753	2.23 yrs.	.961
(females) X_8	.918 yrs.	.582	1.16 yrs.	.669	2.08 yrs.	.884
X_9	*	*	32.67	54.83	36.46	67.80

*Was not included since the variable was not used in the analysis.

LEGEND

X_1 : percent of residents in manufacturing

X_2 : change in the percent of residents in manufacturing

X_3 : Gini coefficient of income concentration

X_4 : change in the percent of residents in agriculture, forestry and fishery

X_5 : change in the percent of self-employed residents

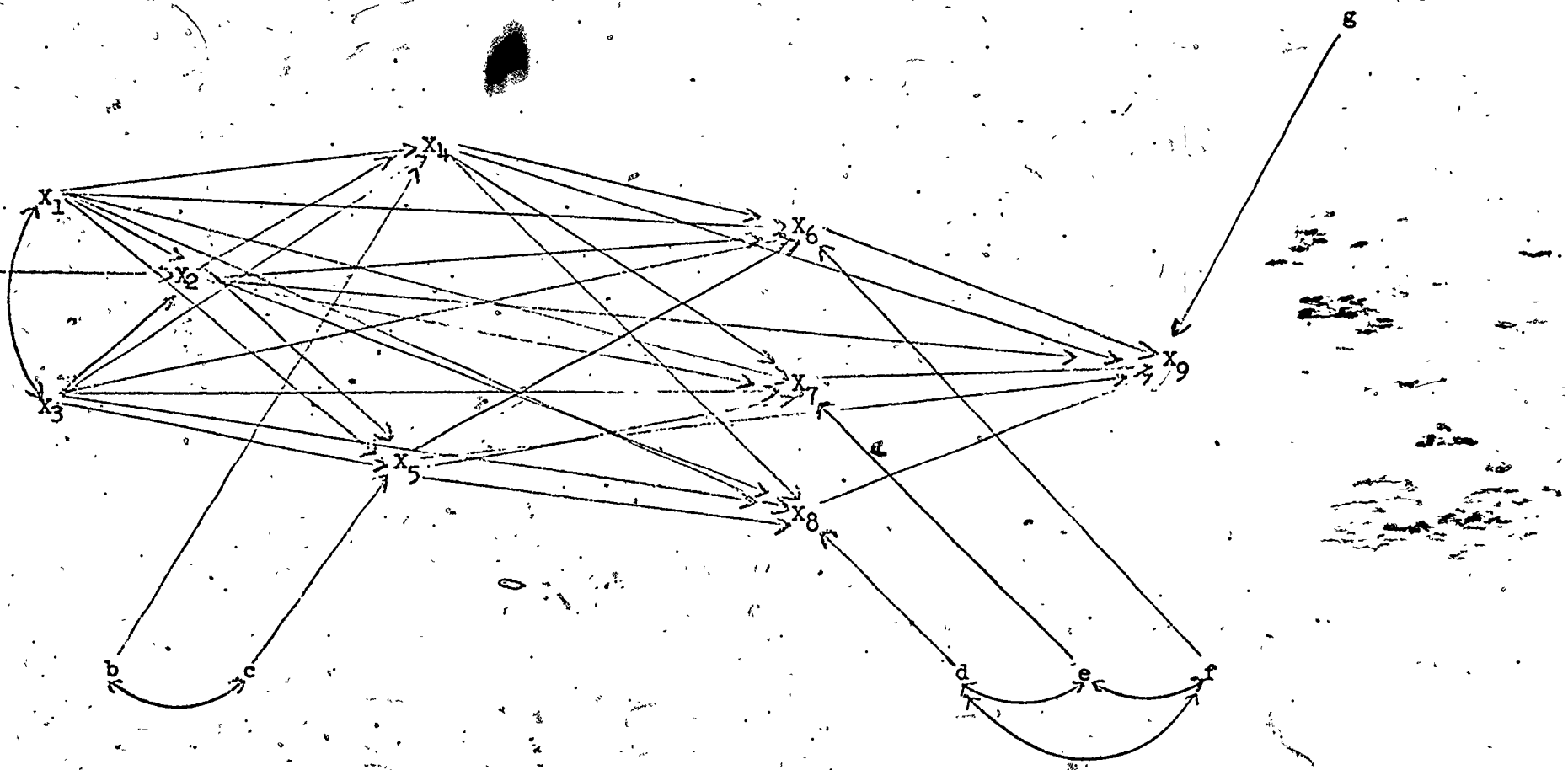
X_6 : change in median family income

X_7 : change in the Gini coefficient of income concentration

X_8 : change in median education, males or females, see figure label

X_9 : incidence of mental disorder per 1000 population

Figure 1. Causal model of the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected interveneing variables. See legend for description of variables



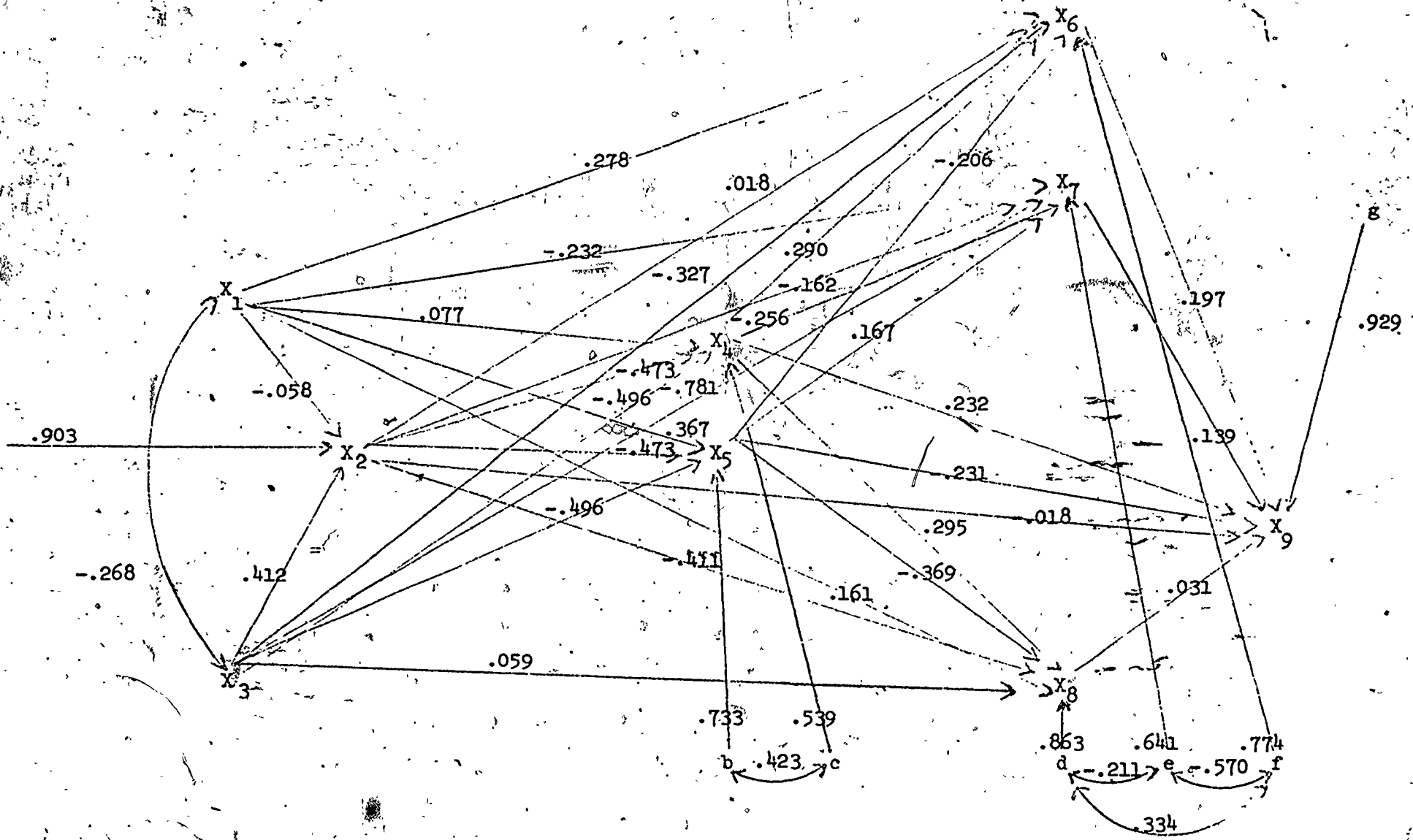


Figure 2. Causal model for the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected interveneing variables. Includes the median education of males. See legend for complete description of variables 1950-1970

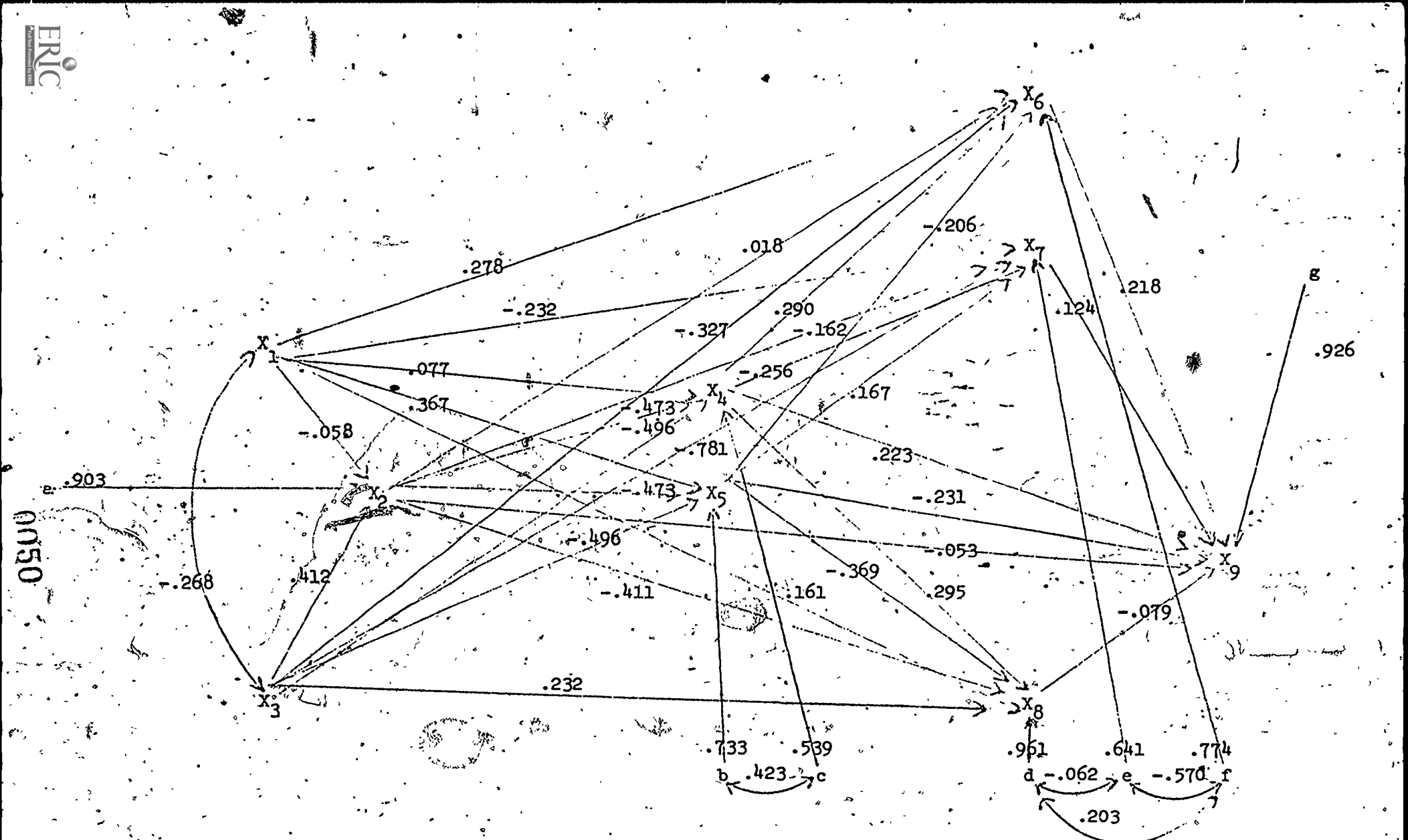


Figure 3. Causal model for the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected interveneing variables. Includes the median education of females. See legend for complete description of variables 1950-1970

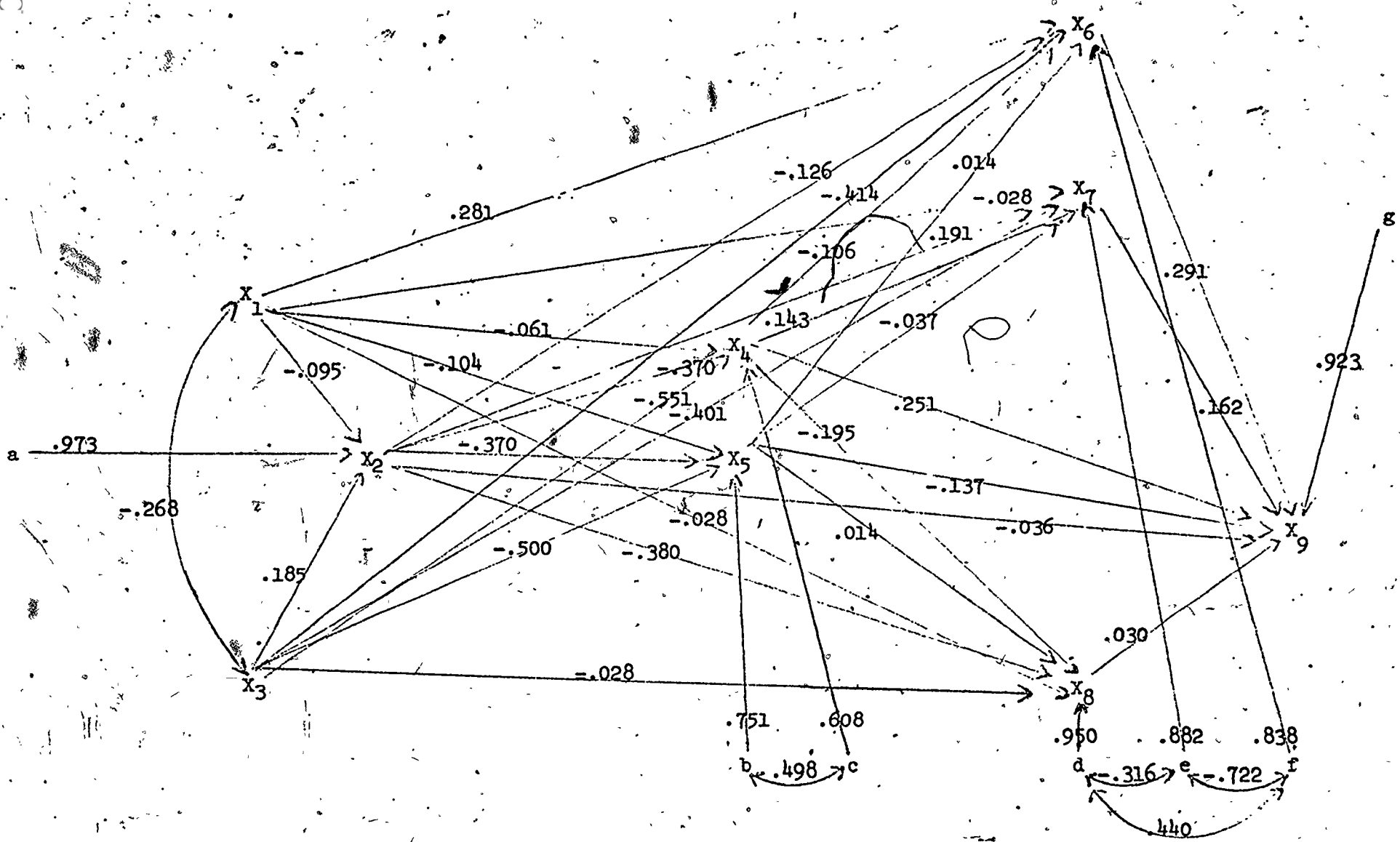


Figure 4. Causal model for the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected intervening variables. Includes the median education of males. See legend for complete description of variables 1950-1960

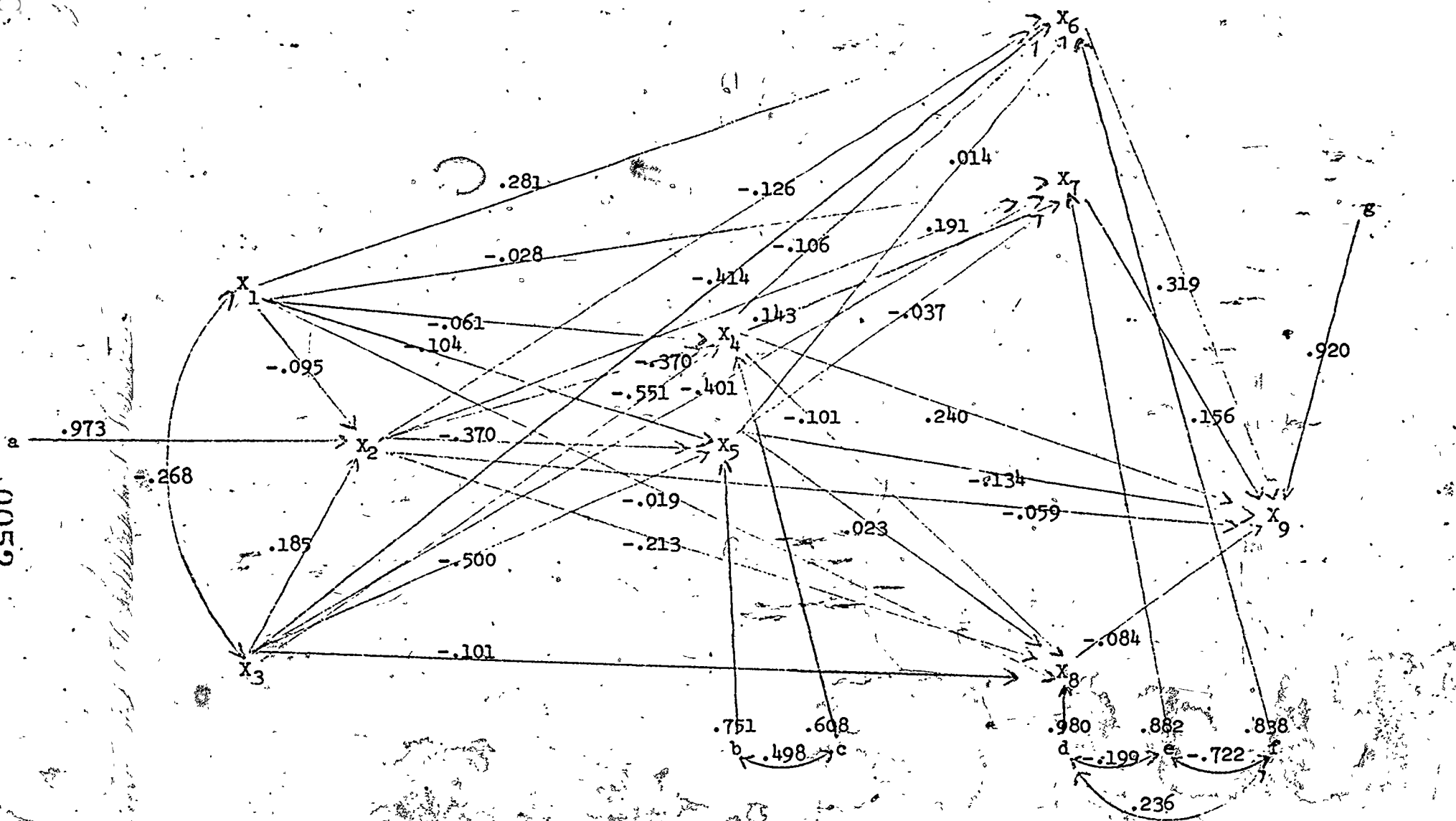


Figure 5. Causal model for the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected intervening variables. Includes the median education of females. See legend for complete description of variables 1950-1960

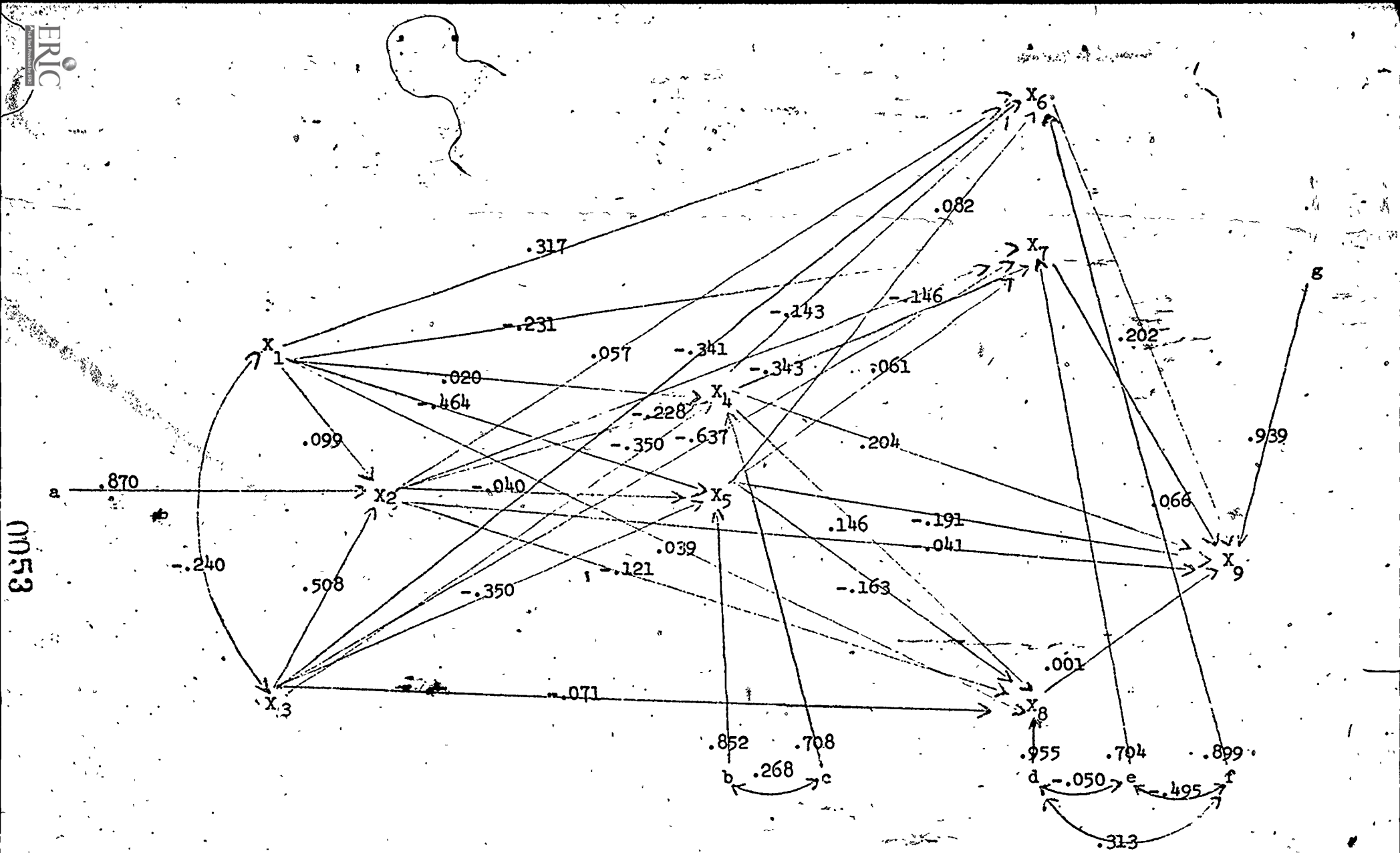


Figure 6. Causal model for the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected interveneing variables. Includes the median education of males. See legend for complete description of variables. 1960-1970

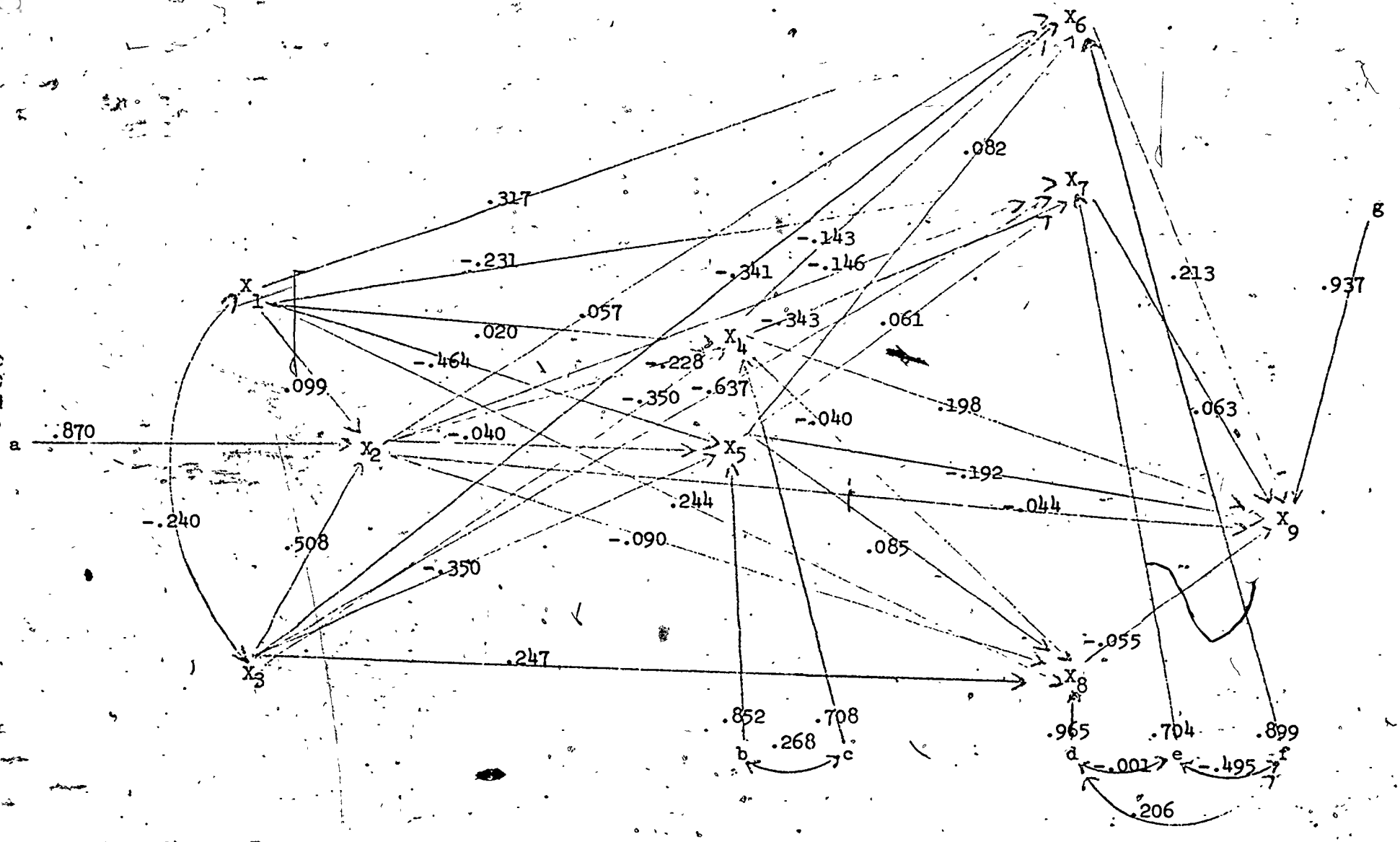


Figure 7. Causal model for the effects of industrial location on the incidence of mental disorder in public mental hospitals and selected interveneing variables. Includes the median education of females. See legend for complete description of variables. 1960-1970

REFERENCES

Adams, Bert N. 1967. "Occupational Position, Mobility, and Kin of Orientation". American Sociological Review. 32 pp. 364-77.

Andrews, R. B., I. V. Fine, A. C. Johnson and E. E. Werner. 1959. "The Effects of Industrialization on Six Small Wisconsin Cities". Wisconsin Commerce Papers II (April).

Andrews, Wade H. and Ward H. Bauder. 1960. "Comparison of Social Change in Monroe and Noble Counties of Ohio". Department Series A. E. 407. Ohio Agricultural Research and Development Center. Wooster, Ohio. (May).

Bean, Frank D., Charles Bonjean, and Michael Burton, 1974. "Intergenerational Occupational Mobility and Alienation". Social Forces. 52 (June): 510-16.

Beck, E. M. and Gene F. Summers. 1973. "Industrial Development and Changes in Occupational Structures". Working Paper RID 73.11 (August), Madison, Wisconsin: University of Wisconsin-Madison, Center of Applied Sociology.

Blalock, Hubert M. 1969. Theory Construction: from verbal to mathematical formulations. Englewood Cliffs, N.J. : Prentice-Hall.

Blau, Peter and Otis Dudley Duncan. 1967. The American Occupational Structure. New York: Wiley.

Bowman, Mary Jean and C. Arnold Anderson. 1963. "Concerning the Role of Education in Development". In Clifford Geertz (ed.) Old Societies and New States. New York: Free Press.

Brenner, M. Harvey. 1973. Mental Illness and the Economy. Cambridge, Mass.: Harvard University Press.

Brinkman, George. 1973. "The Effects of Industrializing Small Communities". Journal of Community Development Society IV (Spring): 69-80.

Coleman, James. 1961. "Community Disorganization". In Robert K. Merton and Robert Nisbet (eds.) Contemporary Social Problems. New York: Harcourt, Brace and World Inc.

Crain, Robert L. and Donald B. Rosenthal. 1967. "Community Status as a Dimension of Local Decision Making". American Sociological Review 32 (Dec): 970-84.

Fanon, Frantz. 1963. Wretched of the Earth. New York: Grove Press.

Foucault, Michel. 1965. Madness and Divilization. Translated by Richard Howard. New York: Random House.

Goffman, Erving. 1961. Asylums. Garden City, N.Y.: Anchor Books, Doubleday and Company, Inc.

Gordon, Richard E. and Katherine K. Gordon, 1960. "Social Psychiatry of a Mobile Suburb." International Journal of Social Psychiatry. VI (Summer): 89-106.

Haller, Archibald O. 1970. "Changes in the Structure of Status Systems". Rural Sociology. 35 (December): 469-87.

Hoselitz, Bert F. 1966. "Main Concepts in the Analysis of the Social Implications of Technical Change". in B. F. Hoselitz and W. E. Moore (eds.) Industrialization and Society. Mouton: UNESCO.

Kessin, Kenneth. 1971. "Social and Psychological Consequences of Intergenerational Occupational Mobility". American Journal of Sociology 77 (July): 1-18.

Kuznets, Simon. 1963. "Quantitative Aspects of the Economic Growth of Nations, VIII, Distribution of Income by Size." Economic Development and Cultural Change. II (January, part II): 1-80.

_____. 1966. "Consumption, Industrialization, and Urbanization." in B. F. Hoselitz and W. E. Moore (eds.) Industrialization and Society. Mouton: UNESCO.

Lauer, Robert H. 1974. "Rate of Change and Stress: a test of the Future Shock thesis." Social Forces 52 (June): 62-73.

Merrill, Kenneth E. and David L. Ryther. 1961. "Plant Location and Community Changes." Center for Research in Business, University of Kansas - Lawrence and Kansas Industrial Development Commission - Topeka. (November).

Moore, Wilbert E. 1963. Social Change. Englewood Cliffs, N.J.: Prentice-Hall Inc.

Moore, Wilbert E. 1965. The Impact of Industry. Englewood Cliffs, N.J.: Prentice-Hall, Inc.

_____. 1966. Changes in Occupational Structures" in Neil Smelser and Seymour M. Lipset (eds.) Social Structure and Mobility in Economic Development. Chicago: Aldine Publishing Company.

Rothman, David J. 1971. Discovery of the Asylum. Boston: Little, Brown and Company.

Sewell, William H. and Robert M. Hauser. 1975. Education, Occupation, and Earnings; achievement in the early career. New York: Academic Press.

Smelser, Neil J. and Seymour M. Lipset. 1966. "Social Structure, Mobility and Development." in Neil J. Smelser and Seymour M. Lipset (eds.) Social Structure and Mobility in Economic Development. Chicago: Aldine Publishing Company.

Stuart, Alfred W. 1971. Rural Industrialization and Population Growth: The Case of Arkansas. Civil Defense Research Project ORNL - AUD - 4(June). Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Stuckert, Robert P. 1963. "Occupational Mobility and Family Relationships." Social Forces. 41 (March): 301-7.

Summers, Gene F., Sharon Evans, Frank Clemente, Elwood M. Beck, Jr. and Jon Minkoff. 1975. Industrial Invasion of Nonmetropolitan America. New York: Praeger Publishers (forthcoming).

Svalastoga, Kaare. 1965. Social Differentiation. New York: David McKay Company Inc.

Thompson, Wilbur R. and John M. Mattila. 1973. An Econometric Model of Postwar State Industrial Development. Westport, Connecticut: Greenwood Press.

Treiman, Donald J. 1970. "Industrialization and Social Stratification." in Social Stratification: research and theory for the 1970s. Edward O. Laumann (ed.) New York: Bobbs-Merrill Company Inc.

Tumin, Melvin M. 1967. Social Stratification: the forms and functions of inequality. Englewood Cliffs N.J.: Prentice-Hall.

Werner, W. Lloyd. 1963. Yankee City. New Haven: Yale University Press,

Wechsler, Henry. 1961. "Community Growth, Depressive Disorders and Suicide." American Journal of Sociology. (July).

Zeltmen, Gerald. 1973. Processes and Phenomena of Social Change. New York: John Wiley and Sons, Inc.