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REGIONS OF CRIMINAL MOBILITY¹

INTRODUCTION TO A DETROIT STUDY

STUART LOTTIER²

It is becoming more and more evident that the problem of crime can be neither theoretically conceived nor practically controlled as a local phenomenon. Beginning with the introduction of the automobile at the turn of the century, our whole social life has been evolving a new territorial character. Two basic changes have occurred: human mobility has increased in amount and altered in kind, and population has become distributed in a new settlement structure fundamentally different from that of the pre-automobile era. In spite of this transition, political boundaries remain unchanged and are still used for administering government services, including the collection of criminological data and the jurisdiction of agencies of crime control. It is the general consensus that the efficient operation of these particular services is restricted by antiquated political confines, and that an adjustment to modern conditions must soon be made. But there is little agreement concerning a specific and objective technique for territorial realignment. The present investigation proposes to determine whether criminal phenomena have a spatial pattern, and, if so, how boundaries of criminal interaction may be delineated.

Popular impression has it that "crime knows no boundaries." But this belief is challenged by the discovery that boundaries (not political) circumscribe social conditions other than crime, that many aspects of contemporary life have a degree of spatial regularity and occur in areas that tend to be internally homogeneous and externally unique. Such unit-areas are called one of several kinds of region. Thus, political-party regions are delineated upon the basis of election returns, sectional regions on the basis of given

¹ Based on a doctoral dissertation, Department of Sociology, University of Michigan, June, 1936. I am deeply indebted to Professors R. D. McKenzie and A. E. Wood who directed the study; to Professors H. F. Adams, R. C. Angell, and J. B. Waite who served on Committee; to Professors R. E. Park, University of Chicago, and E. H. Sutherland, University of Indiana, who offered many helpful suggestions.

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historical traditions shared in common, and metropolitan regions on the basis of their functional integration with particular metropolitan centers. Delineated from these and other factors there are today approximately 100 regional schemes in use.³ *The hypothesis of the present investigation is that criminal phenomena, as an interrelated part of the general social life, have spatial regularity over areas that are larger than cities and are therefore regional.* To demonstrate or refute this proposition requires the analysis of two kinds of data: the mobility of criminals, and the territorial distribution of offenses.

Concrete Statement of the Problem

Criminal mobility is well known. Almost any daily newspaper carries an account of a crime in which the perpetrators fled from the scene in a speeding automobile; posted upon the bulletin boards of most police departments are circulars identifying offenders wanted in other places and advising rewards to be paid for their capture; police radios frequently broadcast to suburban and other places asking cooperation in apprehending fugitives. It is also familiar that moral customs vary between city and country and between different sections of the nation. These general ideas are implied in common parlance, in such phrases, for example, as "sins of the city," "puritanical New England," "pioneer code of the West," "morals are geographical," etc., etc.

A few facts from the career of a recent and widely publicized offender will serve as a concrete statement of the regional problem. The case of John Dillinger is especially suggestive both of criminal mobility and of the relation between the offense and the locale of its occurrence.⁴ Whether or not the case is "typical" is of little concern here, since it is used only as an illustration, and seems to be apt because it is familiar and because Dillinger's frequent elusions of arrest may point to loop-holes in criminological theory and practice. His notorious escapades captured the public eye and brought the usual wave of criticism upon the law enforcement agencies in general and the police in particular. The public response accorded him grew to the enormous proportions of those

³ National Resources Committee, *Regional Factors in National Planning and Development*, Washington, 1935, p. 72.

⁴ A primary source of facts concerning Dillinger is the mimeographed report of the U. S. Department of Justice, Federal Bureau of Investigation, "John Herbert Dillinger, with Aliases; National Motor Vehicle Theft Act," No. I. C. 62-29777, Washington, January 2, 1935. A reliable secondary source is Mildred Adams, "The Evolution of a Criminal: the Case of John Dillinger," *New York Times*, April 29, 1934, Sec. 8, p. 2.

legendary hero-bandits whom Dillinger succeeded in the tradition of the West.⁵

The recorded movements of Dillinger during a period of two months which elapsed shortly before his final apprehension and death are well known. No hypothetical situation is required to illustrate the regional tendencies of present-day crime. The Dillinger case exemplifies three conditions which are the correlative problems of the present research. The first is the spatial pattern of mobility occasioned by Dillinger's use of the automobile. Except for a pleasure trip to Florida and Arizona his movements were largely confined to Illinois, Indiana, and the states adjoining these. Moreover, the movement was not random but was oriented to a dominant center, Chicago. This suggests the possibility that the mobility of criminals in general may occur similarly with reference to metropolitan cities as centers.

The second problem is to determine whether the spatial distribution of offenses has such a pattern. Dillinger worked out of Chicago where are concentrated the specialized services which he required: criminal associates, news, physicians, plastic surgeons, lawyers, cosmeticians—these in addition to recreational opportunities. His anonymity allowed him contact and participation. From Chicago, the transportation center of the area, he plundered the readily available banks and police stations in the surrounding territory. This suggests that if criminals concentrate in large cities then it is possible that distance from cities may function as a factor in the offense rates of outlying areas, that offenses may become less frequent as distance from the city-center increases.

Third, the Dillinger case embraces occurrences which are characteristic of the section of the country over which he operated, but rarely, if ever, take place in certain other sections. The problem is statistically to confirm or reject this as a general tendency.

Only the first of the three problems is investigated in the present report; the others are reserved for future presentation in this *Journal*. The method used here to determine whether criminal mobility has a regional pattern is to describe the areas or distances of criminal movements by comparing them to the regions of mobility of the general population.

⁵ For sensational but none-the-less significant historical antecedents, see *Pat F. Garrett's Authentic Life of Billy the Kid*, M. G. Fulton, Editor, New York, 1927; and Robertus Love, *Rise and Fall of Jesse James*, New York, 1926.

*Regions of Mobility*⁶

Since the concept *region* is usually defined in general flexible terms, it remains to be stated specifically what regional factors the three supposed tendencies have in common. The working definition used in the present study is that a region is an area in which a particular phenomenon is distributed in a regular pattern emanating from an influential center. More exactly, a region is an area dominated by a functional or cultural center and its boundaries are delineated by the distribution of one or more variables which change gradually from the center to the boundary where the trend in an opposite direction begins. Thus, the gradient character of a distribution is the criterion of the region. This requires only that the particular variable increase or decrease regularly with distance from a given center of observation. The particular variables in the three supposed tendencies noted above are criminal mobility and the territorial distribution of offenses, and the given centers of observation are metropolitan cities and traditional sections of the country.

Mobility is a very well known tradition in the United States. But with the growing use of the automobile the character of mobility has changed as has the structure of settlement within which movement takes place. The trend of population distribution is not only towards the city but the city itself is expanding both its area of settlement and its sphere of dominance. With the development of motor transportation the city's population spread into environing areas and many new communities were created and brought under its sway of influence. The upshot of the trend has been the breaking down of the pre-automobile distinction between urban and rural communities. In place of these a regional community of settlement and mobility is developing.

There are three regions delineated upon the basis of mobility centering about metropolitan cities. One is the *commutation area*, roughly synonymous with the "built-up" areas surrounding larger cities and corresponding more closely to the United States Bureau of the Census unit, the metropolitan district.⁷ A second and larger

⁶ *Mobility* refers here only to movement in physical or geographic space whether temporary or permanent. Thus it includes only partially and incidentally Professor Sorokin's conception as change in social position (*Social Mobility*, N. Y., 1927) and Professor McKenzie's conception as change in ecological position ("The Scope of Human Ecology," *American Journal of Sociology*, July, 1926, pp. 141-154).

⁷ The U. S. Census, 1930, defines metropolitan districts as including "in addi-

unit is the *metropolitan region* which is approximately the whole-sale-area or trucking-area around the city. Both of these regions are characterized by temporary or routinized mobility. The third and largest type of region is the *inter-state migrations area* which is delineated upon the basis of longer range movements and consists of a group of adjacent states. It is approximately the overnight rail transportation zone and is defined as the area from which most migrants come to a given center.

Since Detroit is the focal point of the present research there follows a brief description of recent trends in settlement with special reference to Detroit and a specific delineation of the three regions of movement centering about Detroit. Finally, to be analyzed in terms of these regions, there will be presented several indexes to the distance factor in the movement of criminals.

Expansion of Urban Settlement

It is important to notice that the trend towards urbanization and towards an increase in the size of the larger aggregates has been generally constant during the past half century.⁸ But with the appearance of the automobile there began a territorial extension of the areas of contiguous urban settlement. The locus of most rapid growth had been first in the centers of the cities, but it subsequently moved out towards the periphery or outlying areas. Figuratively, city populations have been spilling over or spreading out into the surrounding suburbs and satellite cities. This fact is shown by the relative growth of the central cities and outlying parts of metropolitan districts between 1920 and 1930. In over seventy per cent of the 96 metropolitan districts "the area outside the central city had a higher percentage of population increase than the central city itself. In short, as a rule the suburbs and neighboring smaller cities are growing more rapidly than the central cities."⁹ This tendency is plainly evidenced in the Detroit aggregate: the

tion to the central city or cities, all adjacent and contiguous civil divisions having a density of not less than 150 inhabitants per square mile, also, as a rule, those civil divisions of less density that are *directly* contiguous to the central cities, or are entirely or nearly surrounded by minor civil divisions that have the required density." *Metropolitan Districts*, pp. 5, 6.

⁸ The proportion of the population of the United States which is classified as urban doubled from 28.8 per cent in 1880 to 56.2 per cent in 1930 (U. S. Census, 1930, Vol. 2, Table 1, p. 18). In 1880 there were nineteen cities having 100,000 or more inhabitants while in 1930 there were 93 such cities (*ibid.*, Vol. 1, Table 11, pp. 18-21).

⁹ *Metropolitan Districts*, *op. cit.*, p. 6.

growth of Oakland and Macomb counties, which surround Detroit, began later and continued after Detroit's growth had subsided.

The Detroit Commutation Area.—This smallest of the three regions of mobility has been delineated for Detroit by Waldon who recorded automobile traffic counts for a 24-hour period along five principal highway routes entering the city.¹⁰ A distinct gradient character in the pattern of mobility is shown when the combined totals are plotted by distance from the center of the city: the volume of traffic constantly decreases from the center of the city to a point between the forty and forty-five mile circles. At the fifty mile circle a slight increase in traffic volume is recorded. This is due in large part to the increased volume of traffic going to and from the Detroit satellite city of Flint, Michigan.

McKenzie utilizes these facts as a general index to the size of the motor commutation area. "Although the data refer to all types of motor traffic without regard to type of destination, the proportion of private automobiles is sufficiently great to warrant the conclusion that the 40-mile circle, the point of lowest volume, approximates the outer margin of the motor commutation area."¹¹

Since the boundaries of the commutation area have not been as precisely delineated as have those of the metropolitan district, the latter unit is used as a practical expedient in the analysis of the areas of criminal mobility which follows later. It should be noted, however, that the metropolitan district is delineated upon the basis of the density of settlement and is not primarily an area of mobility. But in the case of Detroit, and probably most other cities, the two are practically identical.¹²

The Detroit Metropolitan Region

Metropolitan regions in every part of the country are primarily economic and commercial areas organized around and

¹⁰ *Metropolitan Highways*, Address before the American Association of State Highway Officials at their Sixteenth Annual Convention, Pittsburgh, 1930, p. 11. Cited in, *The Metropolitan Community*, New York, 1933, circa. p. 87.

¹¹ *The Metropolitan Community*, op. cit., p. 88.

¹² Paver and McClintock state the relationship between settlement density and mobility in the following more general terms: "Where light density of population exists, there usually is found light volume of traffic, and, conversely, where there is heavy density of population, there is usually heavy traffic flow. In the heart of the city is found the closely built-up area, where there is a great concentration of population activity; as one reaches the outskirts, having passed through the residential and suburban areas, one comes to the area of scattered population where the density is low. The space distribution of traffic flow is usually found to be approximately similar to the space distribution of population and its activity." *Traffic and Trade*, New York, 1935, p. 7.

dominated by large central cities. Farmers in the rural areas of the region and manufacturers in the satellite cities truck their products into the dominant center to be marketed. Coming out from the center are newspapers, wholesale manufacturers; and often located in the center are the commercial organizations which integrate many activities of the outlying communities. The metropolitan region is an area of which the component parts are functionally interrelated by routes of communication and transportation.

The boundaries of metropolitan regions have been delineated upon the basis of the volume of communication and the transportation of people and commodities to and from the dominant center. McKenzie and Park divided the United States into coterminous metropolitan regions from the circulation data of metropolitan daily newspapers.¹³ Goodé has delineated somewhat different regions on the basis of more general economic and geographic factors.¹⁴ The volume and destination of motor traffic is one of the more important indexes to the boundaries of the metropolitan region. Paver and McClintock conclude from their analysis of the relations between traffic and trade that "the space distribution of total traffic forms definite patterns that indicate the daily habitual movement of population. . . . These patterns graphically express the life blood of any community."¹⁵

The boundaries between the Detroit, Chicago, and Toledo metropolitan regions have been delineated upon the basis of six tests or services.¹⁶ These are newspaper circulation, telephone toll calls, retail parcels-post package deliveries, wholesale grocery shipments, passenger car traffic, and truck traffic. The six services show six only slightly different boundaries of the Detroit metropolitan region. For the purposes of the present study only the boundary drawn upon the basis of passenger car traffic is used. It is almost identical to the Detroit region delineated from newspaper circulation, cited above.

The Region of Inter-State Migrations to Detroit

The commutation area and the metropolitan region are delineated upon the basis of temporary mobility. Larger distances, in

¹³ *The Metropolitan Community*, op. cit., p. 107.

¹⁴ *Recent Social Trends in the United States*, New York, 1933, C. E. Merriam, "Government and Society," Chapter 29, p. 1495.

¹⁵ *Traffic and Trade*, op. cit., p. 28.

¹⁶ K. H. McGill, *Methods for Delineating the Boundary and Integration Zones of Metropolitan Regions*, Ann Arbor, 1935, unpublished MS.

general, are involved in more permanent or migratory movements. United States census statistics of state of birth show that there is a marked tendency for persons to migrate within a given state or to neighboring states rather than for greater distances. In 1930, of the total native population of the United States, 76.5 per cent were living in the state of birth, 11.3 per cent in adjacent states, and 12.2 per cent in all other states.¹⁷ Thus 87.8 per cent were living in the state of birth or in adjacent states. Further evidence of this tendency may be had from the tabulation of state of birth data by *divisions* of states. Each division consists of from three to nine contiguous states.¹⁸ In 1930, 84.6 per cent of the total native population was living in the division of birth.¹⁹ A notable exception is the Pacific division: the more numerous migrations to this division came from the East North Central and West North Central divisions which are not contiguous to it.²⁰ With this exception, however, the general rule holds true for the country at large that the more permanent or migratory movements are included within the range of several adjacent states.

The distance range of migratory movements to Detroit in particular may be indicated by tabulating the residents of the city who were born in other states by state of birth. The twelve states in addition to Michigan from which 10,000 or more persons migrated who were enumerated as residing in Detroit at the time of the census in 1930, are, in decreasing order, Pennsylvania, Ohio, New York, Illinois, Georgia, Indiana, Kentucky, Tennessee, Alabama, Missouri, Wisconsin, Massachusetts. It is notable even though it may be somewhat exceptional and peculiar to Detroit that these states form a contiguous group, that there are no jumps over states that furnished less than 10,000 migrants to Detroit. This area em-

¹⁷ U. S. Census, 1930, Vol. 2, Table 20, p. 152.

¹⁸ The nine census divisions are as follows: (1) New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; (2) Middle Atlantic: New York, New Jersey, Pennsylvania; (3) East North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin; (4) West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; (5) South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; (6) East South Central: Kentucky, Tennessee, Alabama, Mississippi; (7) West South Central: Arkansas, Louisiana, Oklahoma, Texas; (8) Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada; (9) Pacific: Washington, Oregon, California.

¹⁹ With the exception of the Pacific and Mountain divisions there is little variation between divisions. The Pacific division shows the highest proportion born in other divisions, 52.5, and the East South Central division the lowest proportion, 7.5 per cent. *Ibid.*, Table 10, p. 142.

²⁰ *Ibid.*, Table 21, p. 153.

bracing a dozen adjoining states is considered as the region of inter-state migrations to Detroit

Areas of Criminal Mobility

The significant fact that we are keeping before us for the analysis of criminal mobility which follows is that the three regions described above are not arbitrary units. On the contrary, they are delineated factually as zones of diminishing influence and there are quite definite breaks in the volume of mobility which differentiates them. Yet the breaks are not entire or complete. The commutation area shades off into the metropolitan region, the dominance of which gradually decreases to a minimum and thus locates the boundaries between other metropolitan regions dominated by their respective centers. These in turn comprise regions of inter-state migration.

The assumption implied thus far has been that the areas of criminal mobility are not essentially different from the areas of mobility of the general population. Whether or not this assumption is supported by the facts, we know that criminals utilize the same modes of communication and transportation as do non-criminals and therefore the whole condition of criminal mobility is to be interpreted as relative to mobility in the general population. But this relationship must be explicitly established in order to make relevant the foregoing description of general mobility.

An approach may be made towards determining the character of the relationship between the areas of general and of criminal movement by tabulating measures of criminal mobility as occurring within or outside of the regions delineated upon the basis of the mobility of the general population. The five partial measures of the territorial range of criminal movements between Detroit and other places are as follows:

1. A tabulation of locations other than Detroit in which 500 offenders arrested in Detroit during December, 1934, and January, 1935, had arrest records. The data are taken from the records of 500 consecutive individuals in the "photograph file" of the Identification Bureau of the Detroit Police Department. The Bureau photographs persons whose offenses are "serious" in the discretion of the officer in charge at the time; or who are suspected of recently having committed offenses other than the one for which arrested; or who it is thought might commit further offenses in the city; or whose photographs or other photographs in connection with the

crime are required by the prosecutor as evidence in court. It is the routine procedure to obtain the arrest records of such persons in two clearing houses of criminal identification information: the Federal Bureau of Investigation at Washington, and the Michigan State Bureau of Identification at Lansing. A simple tabulation is made of the places of arrest.

2. An enumeration of the places in which offenders with criminal records in Detroit had been apprehended as indicated by letters requesting identification information received by the Detroit Police Department from 1931 through 1935. During the five-year period 2,038 identifications were made in this manner. This does not refer to the total number of letters requesting identification information received of which there were many more than this number; there were 2,038 offenders positively identified in response to letter requests containing finger prints.

3. A count of telegrams sent by the Detroit Police Department to other places during 1935. Each telegram may refer to none or as many as several offenders who may have a criminal record in none or any number of cities. These data are primarily measures of police communications rather than of criminal mobility. The police usually possess the most recent recorded and unrecorded information concerning the whereabouts of offenders, and, moreover, since telegraphic communication is expensive, it is believed to be a usefully reliable index to criminal movements.

4. A count of telephone toll calls made to other places by the Detroit Police Department from December 10, 1933, to December 10, 1934. The same errors operative in the telegraphic communications apply to this series of data as an index to criminal mobility.

5. An enumeration of the places outside of Detroit in which automobiles stolen in Detroit were recovered during the year 1933. This tabulation is perhaps the most objective of the five series and it measures a definite kind of criminal mobility. But, like the others, it has the disadvantage of incompleteness and is not to be construed as being wholly representative.

The table on page 667 summarizes the indexes of criminal mobility by cumulative percentages of criminal and police contacts between Detroit and places in the five regional and non-regional areas. It is immediately apparent from this that the different indexes show wide differences in the range of movement. No telegrams were sent by the Detroit Police to places within the commutation area (metropolitan district) whereas 59.4 per cent of the

telephone calls were made to places within this area. The proportion of the total of 'phone calls made to places within the commutation area is actually larger than 59.4 per cent because several of these cities may be telephoned from Detroit without a toll charge and hence are not recorded. Only thirteen of the 1,406 toll calls, less than one per cent of the total, were made to the 36 states outside of the region of inter-state migrations.

Approximately the same range of movement described by the toll call series is shown by the place of recovery of automobiles stolen in Detroit. Of 390 automobiles recovered outside of Detroit, 54.9 per cent were found within the commutation area (metropolitan district). Only 10 automobiles or 2.5 per cent of the total

Comparison of Regions and Areas of Criminal Mobility as Indicated by: (1) Places Outside of Detroit in which Were Arrested a Sample Group of 500 Offenders with Criminal Records in Detroit; (2) Places for which Positive Identifications Were Made of Offenders with Criminal Records in Detroit; (3) Places to which Telegrams Were Sent by the Detroit Police Department; (4) Places to which Telephone Toll Calls Were Made by the Detroit Police Department; (5) Places Outside of Detroit in which Automobiles Stolen in Detroit Have Been Recovered; by Cumulative Per Cent of the Total for Each Series.

Region or Area	(1) 439 Arrests	(2) 2038 Letters	(3) 1324 Tele-grams	(4) 1406 Toll Calls	(5) 390 Stolen Cars
I—Detroit commutation area (metropolitan district)	6.3	2.6	0.0	59.4	54.9
II—Detroit metropolitan re- gion	17.5	10.8	8.5	84.4	75.7
III—Outside of the region, within Michigan	18.1	11.5	9.6	87.0	78.5
IV—Detroit inter-state migra- tory area	81.7	85.6	76.3	99.1	97.5
V—Outside of the migratory area (total for the United States)	100.0	100.0	100.0	100.0	100.0

were recovered in the 36 states outside of the region of inter-state migrations.

The three other indexes likewise show a definitely regional pattern but one which is much more extensive territorially than that evidenced by toll calls and stolen automobiles. The striking fact is that these three indexes each indicate pretty much the same range of movement. The 2,038 offenders identified by letters dur-

ing the five year period are perhaps the most representative of these three indexes because of the larger number of offenders and the longer time period. Only 55 or 2.6 per cent of these offenders were identified for places within the commutation area (metropolitan district) and only 10.8 per cent within the metropolitan region. Nevertheless a marked tendency towards a regional pattern is evidenced by the fact that no more than 14.4 per cent of the identifications were made for places outside of the Detroit interstate migratory area.

The summarized data in the table show that the breaks are sufficiently large at the margins of the commutation area that this may be considered to be a region delineated upon the basis of criminal mobility. The validity of the metropolitan region as an area of criminal mobility is demonstrated by the relatively few contacts of any kind which were recorded between Detroit and places in Michigan outside of the metropolitan region. The number of these together with the percentages of the United States total for the respective series is as follows:

	Number	Per Cent
1. Arrests of 500 Detroit offenders.....	3	.6
2. Offenders identified by letters.....	14	.7
3. Telegrams sent to other places	15	1.1
4. Telephone toll calls made.....	36	2.6
5. Stolen automobiles recovered.....	11	2.8

Thus, included within the Detroit metropolitan region is almost all criminal mobility between Detroit and other places in Michigan. But since the metropolitan region is the only one of the three regional units which takes competing centers into account, in order to demarcate its boundaries upon the basis of criminal mobility, data would have to be obtained which describe the movement of criminals to and from Chicago as a center and Toledo as a center. This is the same as saying that the boundaries between the Detroit metropolitan region and the metropolitan regions of both Chicago and Toledo would have to be determined upon the basis of *criminal* mobility. This is not done because the somewhat more specific delineation does not seem warranted. The reasons for this inference are these. The two competing centers are taken into account in delineating the Detroit metropolitan region on the basis of automobile traffic. The five indexes to criminal movements supplement each other in demonstrating the general gradient character of criminal mobility. Also, the number of criminal movements between

Detroit and places in Michigan outside of the metropolitan region is significantly small. These evidences seem sufficient to warrant the view that the metropolitan region as delineated upon the basis of automobile traffic is essentially the same as the metropolitan crime region delineated upon the basis of criminal mobility.

Whether or not the region of inter-state migrations to Detroit may be considered to be likewise a region of criminal mobility requires more than a statement of the fact that most movements to and from Detroit are included within the area. This may be primarily because most of the population of the country is within this area and not as a result of any regional or distance factor. The Middle Atlantic and East North Central divisions had larger populations in 1930 than any of the other seven divisions.²¹ and these two, excepting New Jersey, are included within the Detroit region of inter-state migrations. But examination of the data will show that the size of population *operated as a conditioning factor* and did not remove the element of distance. Thus, New York and Pennsylvania each have larger populations than Ohio yet many more contacts were established between Detroit and places in Ohio. Also, a gradual decrease in the number of contacts goes from Ohio through Indiana, Kentucky, Tennessee, and Alabama although the population of these states does not decrease in this order. On the other hand, more contacts were made between Illinois and Detroit than between Detroit and Indiana which is closer. The reason for this is undoubtedly the fact that the population of Illinois is over twice as large as the population of Indiana. The factor of distance, in this instance, was subordinated to size of population.

These five indexes to criminal mobility all substantiate the contention that criminal movements have a regional pattern. That the commutation area is the zone of most frequent inter-community movements, relative to its size and population, seems to follow from the indexes based upon telephone calls and stolen automobiles. It is the primary zone because it is necessarily involved in movement to more removed places. The coincidence between the metropolitan region and the range of criminal movements follows from the general gradient character of criminal mobility as indicated by the five measures coupled with the fact that very few movements were recorded to places in Michigan outside of the metropolitan region.

²¹ *Ibid.*, Vol. 1, p. 10.

Possible Errors of Interpretation

It is desirable at this point to examine as thoroughly and critically as we may the possibilities of error in the meanings which have been inferred from the data describing the areas of criminal mobility. This does not imply that the data themselves are not open to question; certainly they are, and their shortcomings as measures of mobility have been indicated. But assuming the facts to be accurate *as such*, and this seems to be a fair assumption, more than one interpretation of them is possible. The problem emphasized here is that opposing or other interpretations in considering these data may have been avoided. Do the measures of criminal mobility which have been presented lend themselves only to an affirmation of the regional hypothesis which was advanced in the first paragraphs of this study, namely that criminal phenomena, as an inter-related part of the general social life, have spatial regularity over areas that are larger than cities and are therefore regional?

An argument opposed to such an affirmation might contend that a selected group was the basis for all of the indexes to criminal mobility excepting that based upon stolen automobiles, that the mobility of *arrested offenders* is measured rather than the mobility of a chance selection of criminals. The argument continues that the more able criminal is not apprehended. His mobility may or may not conform to a regional pattern. The place of recovery of stolen automobiles is an inadequate index because this offense is usually committed by non-professional offenders. And therefore the regional hypothesis is left with the Scotch verdict of "not proved."

This same objection may be raised legitimately against almost any criminological investigation. The only alternative to the general procedure followed in this study is to observe the criminal "in the open." Difficulties and complications of such an approach to the problem are legion and it is also true that the results would be more complete if supplemented by data of the present type. None of the data of this chapter pertains to prisoners, all pertain to persons arrested. It is believed that the fundamental error advanced by the argument in the preceding paragraph is thereby minimized in view of the dictum by Sellin that "the value of a crime rate for index purposes decreases as the distance from the crime

itself in terms of procedure increases."²² Many, perhaps most, of the offenders upon which the indexes of the present study are based were released or acquitted; but their mobility is recorded.

A second criticism of an affirmative interpretation of the regional hypothesis follows from the fact that four of the five indexes are based upon police communications rather than the mobility of offenders, and that the police themselves may be assuming a regional hypothesis consciously or unconsciously. For example, if an offender is wanted in Detroit and he is suspected of being in Toledo or San Francisco the police would communicate with Toledo either because they would believe the chances greater that the offender would be there, or because it is cheaper and quicker to communicate with Toledo, or both. This objection would apply to the validity of the indexes to criminal mobility excepting that based upon stolen automobiles and this could be again rejected as inadequate.

Part of this criticism is pertinent and cannot be denied. It is undoubtedly true that if distant places could be communicated with as cheaply and quickly as near-by places, the indexes to criminal mobility might present a different picture. But it is equally true that the same factor, distance, which is a barrier to police communications is also a barrier to criminal movements. It is cheaper and quicker for a criminal or anyone else to go to Toledo from Detroit than to go to San Francisco. Nevertheless it remains unproved whether distance is more or less of a barrier to police communication than to criminal mobility. Moreover, police communications are based upon professional experience in policing, and on the basis of this experience the police believe that offenders with criminal records in Detroit are more likely to have records in proximate places than in remote places. This view rather than the contrary tends to be substantiated by the remaining index, the place of recovery of stolen cars, to which the criticism does not apply.

A third and perhaps final rejection of the regional hypothesis might follow from the fact that there are wide differences in the range of criminal movements shown by the different measures of mobility. The contention might be made that different indexes to the same thing should be more consistent with each other, and if the differences are as large as they are here, then the investi-

²² "The Basis of a Crime Index," *Jour. Crim. Law and Criminology*, Vol. 22, September, 1931, p. 346.

gator must have "different kinds of birds by the tail." If this is the case, then any interpretation of the indexes whatever is fallacious.

This criticism may be entirely refuted. Certainly telegraphic and telephonic communication would not be expected to involve the same distances. One measure supplements the other. The places of recovery of stolen automobiles indicate shorter distances than either the places of arrest of offenders with criminal records in Detroit or the places for which positive identifications were made in response to letter requests, the latter indexes involving different types of offenders. These facts are entirely in accord with the conclusion developed elsewhere,²³ namely, that criminal mobility varies with types of offenses and with types of offenders. That there are differences in the five indexes does not render them valueless. Rather, the differences render them more significant since they can be related to and interpreted consistently with other facts of criminal mobility. Criminal mobility is not conceived as simple and unitary, but rather as a complex and general process.

Conclusion

Criminals and non-criminals both utilize, of course, identical means of communication and transportation. Chief among these is the automobile which has altered the pattern of settlement distribution and the movement habits of our whole people. The general effect of the automobile upon settlement has been to break down the pre-automobile distribution of rural areas and urban areas and to substitute for this a gradient or regional pattern marked by gradually decreasing density of settlement with distance away from metropolitan centers. The general effect of the automobile upon mobility has been to bring about a functional integration of metropolitan centers with the areas which surround them. That the degree of this integration generally decreases gradually with distance from the center is shown by the volume and destination of movement. The mobility of population is greatest in frequency in the metropolitan centers and decreases more or less regularly as distance from the center increases. This gradient character of mobility with reference to the larger cities as centers is the basis for circumscribing regions of movement. Boundaries are drawn

²³ Federal Bureau of the Census, *Prisoners: 1923*, Washington, 1926, p. 92; and *The Prisoner's Antecedents*, Washington, 1929, pp. 54, 55.

at the breaks or points of lowest volume on the gradient where the trend in an opposite direction begins. Three regions of mobility centering about Detroit are delineated in this manner: The Detroit commutation area, having a radius of about 35 miles; the Detroit metropolitan region, extending from about 50 to 400 miles from the city; and the region of inter-state migrations to Detroit, consisting roughly of several states surrounding Michigan. The former two regions are characterized by temporary or routinized movements and the latter by more permanent, longer-range movements.

Applying these regional units to an analysis of the mobility of criminals, the most general conclusion evidenced from the data is that distance is a factor in the movements of criminals just as it is a factor in the movements of the general population. The volume of criminal mobility to and from a particular center varies inversely with distance from the center. The more frequent criminal movements are included within the commutation area and the metropolitan region. Those criminal movements which are outside of the metropolitan region are almost entirely included in the adjacent states within the region of inter-state migrations to the dominant center. The boundaries of the metropolitan region are not simple and unitary but rather are manifold, representing zones of diminishing influence. Likewise it appears that there is not one region of criminal mobility but several, the principal three types of which have been described. Thus the crime region is a reality as evidenced by the gradient character of criminal mobility.