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# THE INFLUENCE OF THE SEASONS ON THE CRIME RATE

Gerhard J. Falk

The author is an instructor in the Department of Sociology in the University of Pennsylvania. He was formerly with the South Dakota State College. Mr. Falk has prepared numerous tabulations of data relating to the subject of this article. They are available at 3943 Locust Street, Philadelphia. Readers who are interested in the subject matter are invited to correspond with him at that address and to cooperate with him to the end of increasing the sum of his data and making further analyses.—EDITOR.

## HISTORICAL

One of the earliest studies of seasonal influence on crime was made by a French civil servant, Guerry de Champneuf, who collected some data regarding the crime rate in 86 different French departments. On the bases of these figures he attempted to show the difference existing in various geographical areas, with reference to the number of persons accused of crimes.<sup>1</sup>

It was thus only incidentally that seasonal variation was studied. Nevertheless, Guerry stated some oft repeated conclusions. Says he, ". . . whereas the crimes against persons are more numerous in the summer, the crimes against property are more numerous in winter . . .".<sup>2</sup>

Dexter<sup>3</sup> published an extensive study of weather influences on crime, in 1904. No adequate study of seasonal crime rates was available, however, before the translation of the fourth volume of Lombroso's "Criminal Man" appeared in 1911 under the title "Crime, Its Causes and Remedies."<sup>4</sup>

Combining statistics shown by Guerry on sex crimes in England and France with those of Curcio who studied the same offenses in Italy, Lombroso gives a table of such crimes by percentage in those three countries.<sup>5</sup> Murder, according to the same studies, reaches a maximum in the hottest months.<sup>6</sup>

Lombroso investigated political crimes also and concluded that the 836 rebellions which occurred between 1791 and 1880 in the whole world predominate in the hot months as well. Thus, in Europe and America, July is the month with the greatest frequency of rebellion, and in South America the greatest frequency occurs in January, the hottest month there.<sup>7</sup>

1. JOSEPH COHEN, *The Geography of Crime*, ANNALS AMER. ACAD. OF POL. AND SOC. SCI. 217:29, September 1941.

2. M. C. ELMER, *Century Old Ecological Studies in France* AM. J. OF SOCIOL. 34:65, July, 1933.

3. EDWARD G. DEXTER, *WEATHER INFLUENCES*, New York, Macmillan, 1904 p. 41.

4. CESARE LOMBROSO, *CRIME, ITS CAUSES AND REMEDIES*, Boston, Little, Brown, 1912, p. 4.

5. *Ibid.*, p. 5.

6. *Ibid.*, p. 5.

7. *Op. cit.* p. 6.

Continuing this study, Lombroso presented a table showing a seasonal summary of rebellions in Europe during a century. This table shows, says Lombroso, that in nine countries, including all southern countries, the summer ranks in first place. With four nations, including the southernmost, it is spring. Only in Austria-Hungary does autumn rank first, and in another, winter (Switzerland).<sup>8</sup>

Spring has more revolutions than autumn, and winter has more revolutions than fall, in five cases; fewer in eight cases and the same in three.

Considering the two hemispheres, Lombroso again found that summer had the greatest number of revolutions, as does crime. Thus, 167 out of 495 European revolutions took place in summer and 92 out of 288 American revolutions occurred in the same season.<sup>9</sup> Finally, he quotes Guerry in relation to crimes against the person and their seasonal variation and presents his conclusions on the basis of an index of 100. Thus, of 100 crimes against the person in England 26.20 occurred in the spring, 31.70 in the summer. Simultaneously, 26 percent of such crimes in France happened in the spring and 37.31 percent in the summer. Thus here again summer and spring predominate. Lombroso ascribed this chiefly to the beginning of the first yearly heat.<sup>10</sup>

Following Lombroso, Enrico Ferri published a study in a German magazine entitled, *Das Verbrechen in Seiner Abhängigkeit vom Jährlichen Temperaturwechsel*.<sup>11</sup> One of his considerations was the frequency of sex crimes by month. From statistics of such crimes in France between 1827 and 1869 he found that such offenses show their maximum and minimum frequencies in the same months for all these years. On the basis of a table he shows that the influence of seasons is about the same in relation to sex crimes against children or adults, since both categories show a maximum of sex offenses in June. The only difference exists in the fact that the month of May ranks second with adults and July ranks second with children.<sup>12</sup>

In 1891 William Douglas Morrison, then warden of Wandsworth Prison in England, published *Crime and Its Causes*. Referring to the annual reports of the British Prison Commissioners, he shows that there is a decline in the prison population from October to February every year. This is shown by analyzing a diagram of prisoners in England

8. LOMBROSO, *op. cit.* p. 6.

9. *Ibid.*, p. 7.

10. *Op. cit.* p. 7.

11. ENRICO FERRI, *Das Verbrechen in Seiner Abhängigkeit von dem Jährlichen Temperaturwechsel*, ZEITSCHRIFT FÜR DIE GESAMMTE STRAFRECHTSWISSENSCHAFT 2:38, September 1882.

12. LOMBROSO, *op. cit.* p. 38.

and Wales, showing the mean number of prisoners in those localities on every 1st Tuesday of the month.<sup>13</sup>

Following this, Morrison poses the question as to the reason for the steady rise and fall in criminality which is so evident. First he refutes a number of existing theories, especially the idea that increased alcohol consumption increases the prison population, and finally concludes that it is the weather which causes this both directly and indirectly. Thus "It is the good weather that multiplies occasions for human intercourse; the multiplication of these facilities augments the volume of crime; and thus it comes to pass that the conduct of society is, at least, indirectly affected by changes of season and the oscillations of temperature."<sup>14</sup>

This is of course an example of the indirect dependance of crime on weather conditions. However, in order to show a more direct relationship between these two factors, Morrison goes on to prove that infractions against prison rules on the part of incarcerated men also increase in the summer, and that therefore there must be a direct, physiological cause for increased criminality in the summer. Since all prisoners are under the same social and economic conditions these cannot be held responsible in this case.

Morrison claims also that crimes against property do not increase in the winter, but that such crimes increase with crimes against the person in the summer.<sup>15</sup> "It is . . . fallacious to imagine that property is less safe when the days are short and the nights long."<sup>16</sup>

Alexander von Ottingen, in his *Moralstatistik* of 1882<sup>17</sup> discussed both sex crimes and crimes of another character in his book. To begin with we find a table taken from Guerry and already quoted by Lombroso<sup>18</sup> showing the number of sex crimes committed per month in France and England over a number of years. His conclusions regarding this table are as follows:

In both countries, the increase or decrease of light has a direct effect on crime. The greater the heat, for instance, the greater is sensual excitement, and therefore rape is more frequent. The statistics also show evidence of greater sensuality in hot climates. Ottingen points out that the greatest monthly difference between France and England is in July, the hottest month. This he attributes to the greater heat in France.

13. WILLIAM D. MORRISON, *CRIME AND ITS CAUSES*, London, Sonnenschein, 1891, p. 61.

14. MORRISON, *op. cit.* p. 66.

15. *Ibid.*, p. 74.

16. *Ibid.*, p. 74.

17. ALEXANDER VON OETTINGEN, *DIE MORALSTATISTIK UND IHRE BEDEUTUNG FÜR EINE SOCIALETHIK*, Erlangen, Deichert, 1882.

18. See p. 1.

In contrast to Lombroso's idea that great heat stifles criminality, Ottingen seems to believe that there is a direct correlation between the degree of heat and the volume of crime. He further attempts to substantiate this by showing that England has a higher crime rate than France in September and October, because England has a mild autumn. To prove this point adequately, Ottingen grouped Guerry's statistics according to quarters in the year with the result that the fall quarter, including September, October and November, shows 24.38 percent of all annual sex crimes in England, while the same period in France shows only 26.64 percent of yearly offenses.<sup>19</sup> Continuing his quotations of Guerry's studies, Ottingen also concludes that premeditation makes a difference in the seasonal variations of the crime rate. Murder, arson, perjury, forgery and poisoning, some being crimes against the person and some against property, all show no constant, but rather a zig-zag curve during the year.

While theft is generally dependent on the season of the year, house-breaking is free from such influences because housebreakers are not influenced by the increased poverty in winter, but rather by premeditation and opportunity.<sup>20</sup>

If, says Ottingen, we combine the crimes against the person and those against property and compare these with the yearly frequencies of sex crimes then a constantly opposing movement may be noticed for attacks on the person and property during the chief seasons.

In the fall quarter the crime quota between the two groups comes closest. In the spring quarter the crimes against the person increase and reach a maximum in the summer, while theft culminates in the winter. The tendency which is dominant with crimes against the person runs parallel to that of sex attacks. With these, however, the tendency is even more pronounced.<sup>21</sup>

*Verbrechen und Verbrechenertum in Osterreich* appeared in 1908 and includes a short discussion of the seasonal influences on crime. Hugo Herz, the author, presents figures showing crimes by month during the years 1898 to 1902 for the county of Brünn in Austria.<sup>22</sup> From these figures Herz draws several conclusions. First, that crime against property is most frequent in the autumn and winter months, an observation often verified by other studies. Further he agrees with others that the opposite tendency is evident with crimes against the person. So far then

19. *Ibid.*, p. 238.

20. *Ibid.*, p. 489.

21. *Op. cit.* p. 489.

22. HUGO HERZ, *VERBRECHEN UND VERBRECHERTUM IN OSTERREICH*, Tübingen, Laupp, 1908.

nothing has been added to already known factors. However, it is interesting to note his listing of crimes against the state. Apparently, crimes against the state do not show regular movements although there is an enormous increase of them during October. Herz explains this on the grounds that this was the month of greatest unemployment in Austria, and that many tried to get support in prison during such times by insulting the emperor.<sup>23</sup>

The reasons for increased crimes against property in the winter are those generally recognized. Needs increase for several reasons. First, there is a higher metabolic action, so that it takes more to keep the body warm and fed. Secondly seasonal unemployment reaches its peak in winter and thirdly, there is a peculiar Austrian situation described by Herz. It seems that most of the workers in Austrian cities came from small towns. When seasonal unemployment threw these people out of work in October, most of them went back to the town of their origin in hope of relief. This however, was not forthcoming and vagabondage and criminality increased thereafter.

Crimes against the person and their seasonal movement is explained by Herz on the basis of Ferri's and Lombroso's study.

In the year 1913, Gustav Aschaffenburg published his important volume, "Crime and Its Repression." Together with a number of other interesting studies, he examined the relation of crime and the seasons by quoting Ferri and his earlier attempts in the same direction. In addition to Ferri's table of Sexual Crimes in France, Aschaffenburg also shows the percentage distribution of offenses per month and excerpts from "Statistics of the German Empire."<sup>24</sup> Aschaffenburg gives a table, showing the criminality of Germany according to the year and month when crimes are committed. This table is constructed on the basis of 100 offenses per day in the year and the relative number of offenses per day in the month.<sup>25</sup> From this, Aschaffenburg concludes that there is an increase in sexual crimes beginning in March with a maximum reached in July. In fact, July exceeds the winter months by more than double the number of sex crimes. Thus, some connection between sexual excitability and the season of the year is evident, especially since the days of conception also culminate in December and May.<sup>26</sup>

Theft and fraud, also considered on the basis of the assumption that there are 100 offenses per day in the year, never reach 100 per day in

23. HERZ—*Ibid*—p. 68.

24. GUSTAV ASCHAFFENBURG, CRIME AND ITS REPRESSION, Boston, Little, Brown, 1913 p. 17.

25. *Ibid.* ASCHAFFENBURG p. 16.

26. *Ibid.*, p. 19.

the month. An increase may be found in the winter and a decrease in the spring and summer. The pressure of cold months is gone in the warm months and expenses for heat, light and clothing is less. Further, the darkness of night in winter increases burglary. Since, however, petty thefts increase more, the hardships of hunger seem to make the difference. Weak resistance against temptation is the result of social misery and produces dishonesty.<sup>27</sup>

"Criminality and Economic Conditions" by William Bonger includes a brief mention of the relation of crime frequencies to time variation. Bonger's main object in this connection, is to prove that absolute poverty provokes thefts and crimes against property.<sup>28</sup> From a table appearing in "Kriminalstatistik für das Jahr 1894" he reaches this conclusion. All of the crimes mentioned in the table show an increase in winter and a decrease in the summer, but simple theft and the receiving of stolen goods show this in a much more marked way than embezzlement, aggravated theft or habitual receiving. The two former crimes have poverty as their main cause, whereas the three latter are the result of cupidity by professional criminals.<sup>29</sup> The figures given are what the daily average for that month would be if the daily average for the year were 100.

The same attempt is made in regard to crimes against the person, showing as usual that violence reaches a peak in the summer and minimum in the winter. Bonger explains this on the grounds that in the summer persons are more in contact with each other, a fact which gives opportunity for disputes and increases danger of consequent crimes.<sup>30</sup>

In connection with a study of alcohol consumption and its influence on criminal activity, Bonger gives the days of the week on which assaults occur parallel with some assumptions on the general use of alcohol, etc.<sup>31</sup> Bonger's data are from Löffler "*Alkohol und Verbrechen*," pp. 533-534; from Lang "*Alkohol Genuss und Verbrechen*," and from Aschaffenburg "*Crime and Its Repression*." Assuming that alcohol is consumed in greatest quantities on Sunday, Monday and Saturday, the data agree with the thesis that alcohol is important in the etiology of assault of similar crimes.<sup>32</sup>

"*Statistik und Gesellschaftslehre*," is a book of several volumes which appeared in 1917 and soon became an oft quoted work and an important

27. *Ibid.*, p. 30.

28. WILLIAM A. BONGER, *CRIMINALITY AND ECONOMIC CONDITIONS*, Boston, Little, Brown, 1916.

29. *Ibid.*, p. 565.

30. *Ibid.*, p. 566.

31. Bonger, *op. cit.*, p. 640.

32. *Ibid.*, p. 640.

contribution. In the third volume of this book, von Mayr, the author, investigates extensively the topic of criminal frequency. He has a number of important suggestions and contributions to make, some of which are reviewed here.<sup>33</sup>

The measure of criminal threat, says Mayr, is not expressed by the number of persons committing criminal deeds, but rather by the number and type of offenses committed. Thus, by correlating the number of offenders to the number of the punishable population the "*Verfehlertziffer*", or offender index is reached. The number of the punishable population are all those over twenty-one years of age, i.e. legal adults. Nevertheless, Mayr, believed that one may measure what the potentially criminal population may produce in number and types of crimes by correlating the number of offenses to the number of people of age. This results in the "*Verfehlungsziffer*," or offense index.<sup>34</sup>

Von Mayr continues by quoting the "Statistics of the German Empire" for 1883-92 and concludes that there is a characteristic dependence of the rise and fall of crime frequency in Germany on the seasons of the year. This dependence is less if the total offenses are considered rather than the individual offense groups, since the opposite influences of the seasons on the main offense and crime groups cancel each other out.<sup>35</sup>

If the total crime rate is thus considered, it follows that it culminates in August, while it is even the rest of the year. Offenses against the state, separately considered follow about this pattern. Thus, the connection between seasons and offenses is shown chiefly with the two main groups, offenses against the person and offenses against property. Both show a regular rise and fall, reaching their maximum and minimum at opposite times of the year. Offenses against the person reach their maximum in August, their minimum in December, while offenses against property reach their maximum in December, and their minimum in April.<sup>36</sup>

This difference in seasonal variation between the two offense groups would be even greater if offenses related to both groups were eliminated. Thus, "pure" offenses against the person would be those which involve only an attack on the body, such as assault or rape, but does not include attacks for economic gain such as robbery. In the case of "*Raubmord*," robbery involving murder, the rise in the summer of offenses against the person as well as the rise in the winter of offenses against property are

33. GEORG VON MAYR, *STATISTIK UND GESELLSCHAFTSLEHRE*, Tübingen, Mohr, 1917, III.

34. *Ibid.*, p. 607.

35. VON MAYR, *op. cit.* p. 608.

36. *Op. cit.* p. 608.

noticeable. Von Mayr reports this on the basis of a very small sample of 116 cases.

If "pure" offenses against property are considered in the same light, then it is found that the percentage of such offenses is much higher here than in the previous group. This is mainly true because the thief wants only to enrich himself, having no particular reason to injure another person. Nevertheless, there are combinations of offenses against property mixed with offenses against the person. This is chiefly true with property destruction which does not enrich the perpetrator but only hurts the victim. This offense follows the seasonal course of offenses against the person. The same is true also for arson. We see then, that the elimination of offenses which fall into both categories prove the rule of seasonal opposites in the two main offense groups.<sup>37</sup> Von Mayr now begins a consideration of the reasons for the constant seasonal variations in criminality which are so obvious. First, he assumes that the influence of nature plays a great role in this process. Changes in season always bring with them changes in the length of days and in temperature. This in turn causes the promotion or inhibition of offenses, either directly through increased temptation or rejection of temptation, or through collective and social consequences which raise resistance to temptation or weaken it. Attacks against the person usually belong to the first category, being directly influenced by temperature or light conditions. Attacks against property are indirectly influenced and are the result of social conditions which are outgrowth of seasonal changes. Theft, for instance, comes about in the winter when there is a general increase in the difficulty of making a living. There are, however, exceptions to this general rule, since for instance, catastrophic political or social situations or out-door gatherings in the summer may turn into mass attacks against the members of a particular group, etc.<sup>38</sup>

Finally another question arises in this connection. This is the relative effect of changes in temperature and changes in the length of days on the crime rate. Reviewing some of Durkheims arguments, von Mayr concludes that the temperature is much more important than the amount of light, since August, which has less daylight than June, nevertheless leads that month in frequency of offenses against the person.<sup>39</sup>

Von Mayr concludes his study of seasonal variations of the crime rate by giving some examples of criminal statistics for various countries, each of these showing a specific characteristic as mentioned by the author

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37. *Ibid.*, p. 609.

38. VON MAYR. *Op. cit.*, p. 609.

39. *Ibid.*, p. 609

before. The first of these are some Hungarian statistics for the years 1904-1908, given by season. These figures illustrate mainly the characteristic contrast between the yearly course of "pure" crimes against the person and "pure" crimes against property.<sup>40</sup> In order to demonstrate the rise of offenses against public order and the rise of body injuries in the summer and spring, von Mayr quotes from the Belgian "*Statistique Judiciaire*" of 1910-11<sup>41</sup> which indicates a regularly rising frequency of offenses against the public order and against the person in warm temperatures, and a decline of these during the cold seasons. This is true in total as well as individual figures.

Sexual crimes in relation to seasons are exemplified by statistics from the Dutch volumes, "Contribution to Criminal Etiology," no. 1. On the basis of 1190 cases of sex crimes taking place from 1902-1906, the daily average per month shows the usual culmination of cases in July and depression in December. Von Mayr examines similar statistics in Denmark and Italy, and then continues with a reference<sup>42</sup> to certain Argentine figures as examples of crime variations in the southern hemisphere.<sup>43</sup> These indicate the opposite tendency by month, if compared to the northern hemisphere, since October to March are the spring and summer months and also show an increase in the crimes typical of these seasons.

Von Mayr concludes his study by calling for an increase in the sources used for criminal statistical analysis, by taking into consideration all cases ever reported to the police or known by other agencies.<sup>44</sup>

We turn now to a more recent American study which is unique for its conclusions and method. "Homicide in the U. S." was published in 1932 by H. C. Brearly and deals in part with seasonal variations of homicide, mainly using South Carolina statistics. Examining homicide frequency from 1920-1926 in South Carolina, the gross numbers show that winter had 404 homicides, spring 367, summer 430, and autumn 400. When these numbers are corrected for thirty-one days per month the figures change to: 413.5, 371.2, 434.4, and 409.4 respectively. On the basis of this, Brearly says that "the distribution of cases by seasons failed to show any close relationship between the temperature and the amount of homicide." In 10 of 12 months, he continues, the range from the lowest to the highest number in any one year is greater than the

40. *Ibid.*, p. 609.

41. *Ibid.*, p. 611.

42. VON MAYR, *op cit.*, p. 611.

43. *Ibid.*, p. 612.

44. *Ibid.*, p. 614.

45. H. C. BREARLY, HOMICIDE IN THE UNITED STATES, Chapel Hill, Univ. of N. C. 1932 p. 178.

minimum. December is higher than either July or August, and there is a lack of consistency in the data, since July ranges from the lowest number of 12 to the highest of 33, while September ranges from 10 to 33.<sup>46</sup> To quote further from Brearly, this is the analysis he makes: ". . . since the number of homicides was greater for both summer and winter, it appeared possible that the factor of deviation from the mean temperature might be of importance, changes causing increased discomfort, and, perhaps, greater emotionality. Accordingly, the mean temperature for each of the 72 months in the years being studied was compared with the normal annual temperature, 63 degrees Fahrenheit. The deviations in either direction from the normal average temperature were then correlated with the number of homicides in each month, the Pearson formula being used. The coefficient was only  $+0.135$  with a probable error of  $+0.072$ . The relationship therefore, between the number of deaths by homicide and the changes from the average temperature appears to be one of mere chance, as far as this method of measurement is to be relied upon."<sup>47</sup>

There seems to be some relation between holidays and crime, as indicated by Brearly's report that homicides reach a high point during Christmas week with a peak on Christmas day.

To get more representative data of seasonal variations, Brearly next shows a study based on the monthly distribution of homicides in the United States for the six years, 1923-28.<sup>48</sup> Considering these statistics, it appears when the number of homicides are corrected so as to compensate for some short months, there are actually more homicides in winter than in spring and more in the summer than in any other season. This partially confirms and partially refutes Ferri's thermic law of crime. By erasing the tables, it also appears that the data for November and December are distinctly at variance with the mean temperature for these months and that there is a lack of uniformity for yearly seasonal trends. This, say Brearly,<sup>49</sup> proves the absence of any close relationship between homicide and mean temperature. There is a possibility that the increased number of homicides in November and December are due to Thanksgiving and Christmas. Therefore the true figures may have to be corrected by eliminating the holiday factors.

Another modern study of criminality and its relation to monthly fluctuations was published by Joseph Cohen in 1941. Using the Uniform

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46. *Ibid.*, p. 177.

47. BREARLY, *op. cit.*, p. 179.

48. *Ibid.*, p. 183.

49. *Ibid.*, p. 184.

Crime Reports of 1935-1940, Cohen shows the monthly variations in aggravated assault and murder known to the police in cities of 100,000 population during these years.<sup>50</sup> The figures given are index numbers based on the assumption that 100 equals the average annual rate.<sup>51</sup> Cohen concludes from these that the low point in both crimes comes in January and that the annual daily average is approximately in May. The peak occurs in mid-summer when a gradual decline sets in through the winter, with a holiday rise in December. Where as the peak month always comes in summer, there is nevertheless a great variation in both maximum and minimum month, especially for murder.<sup>52</sup> The peak incidence of robbery is in December when the rate decreases until it is only 50 percent of the maximum in July. There is a constant pattern from year to year; although burglarly rates are not as regular as robbery rates. There is not so much difference here between the low in the middle of the year and high in mid-winter. The general implications of these factors are that crime is a seasonal phenomenon, that crime against the person predominates in the summer and against property in the winter.<sup>53</sup>

Cohen mentions several reasons for the lack of interest in seasonal variation and crime. Until the Uniform Crime Reports were published, very little confidence could be placed in the available data. Besides there was a disrepute of all theories "that rested on an alleged consonance between the fluctuation of crime and other social data." Since the war, emphasis has been so much on the individual and his motivations, that correlation methods were considered inadequate in explaining why one individual commits robbery and another assault etc. Finally, Cohen points out that a large number of seasonal crime variations are obvious and do not pose a scientific problem at all, especially since this has been investigated to a considerable extent.<sup>54</sup>

#### CURRENT DATA FROM U. S. CITIES

The purpose of the data presented in the following pages is to examine whether there is a consistent and regular variation of the crime rate by hour of the day, day of the week and month of the year.

For this purpose, ten annual police reports of eight American cities were examined and the appropriate statistics used. These eight cities

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50. JOSEPH COHEN, "*The Geography of Crime*", *THE ANNALS*, Vol. 217, 1941 p. 32.

51. *Op. cit.*, p. 33.

52. *Ibid.*, p. 34.

53. *Ibid.*, p. 34.

54. *Ibid.*, p. 35.

were selected from a list of cities whose police departments use the "Guide for Preparing Annual Police Reports," issued by the U. S. Department of Justice.<sup>55</sup> Whereas most of these reports give statistics for a large number of offenses, only the offenses listed under Part I Classes of the "Uniform Crime Reporting" manual were considered for this paper.<sup>56</sup> These are: Felonious Homicide, Rape, Robbery, Aggravated Assault, Burglary, Larceny and Auto Theft. The cities involved are Buffalo, Cincinnati, Denver, Detroit, Ft. Worth, Los Angeles, Rochester and St. Louis.

Since ten consecutive annual reports for these cities were not always available, an attempt was made to use any ten yearly reports, as closely together as possible. For instance, reports for the city of Buffalo used in this study are for the years 1928-1932, 1934-1935, 1938-1939 and 1946. It is assumed that this has no particular effect on the results, since no special reference is made to any frequency variation of crime by decade. Therefore the years examined, whether consecutive or not, are merely representative of the average year with reference to crime frequency.

The first step in developing the data referred to was to copy from the annual police reports the number of offenses which occurred at any particular time or during certain days of the weeks or months of the year in the city selected. Thus, the data so obtained will lend itself to computing the average number of offenses which took place during a given time span over a number of years in a selected city.

Of all the police reports used, only Cincinnati gives the crime frequency by the day of the week and this began in 1944, i.e., five years before the last available annual report.

Once the average number of offenses had been computed a table was set up for each offense in the Part I class of the Uniform Crime Report by the month of the year. A second table for each offense for hour of occurrence etc. The ten year averages shown on these tables were then added and plotted on a graph. It was then assumed that the average monthly homicide rate for the five cities involved is 100 and on that basis the percent distribution of homicides was computed. From these computations we may conclude that the greatest frequency of homicide comes in July, that is, in the summer season. Since it is generally agreed that attacks on the person reach

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55. THORSTEN SELLIN, *RESEARCH MEMORANDUM ON CRIME IN THE DEPRESSION*, New York, Social Science Research Council, 1937, p. 93.

56. *UNIFORM CRIME REPORTING*, New York, International Association of Chiefs of Police, 1929, p. 24.

their maximum in the summer, this figure seems to be in accordance with other studies. However, it should be noted that the other two hot months, June and August, trail behind October and December in murder frequency. The sudden rise in frequency occurring in December may be attributed to the holiday season. The lowest frequency occurs in the two spring months of March and April. Since these are not the coldest months in the year these figures do not agree with the assumption that there is a direct relationship between temperature and homicide frequency.

Two other crimes against the person investigated in this study were rape and aggravated assault. Rape shows a frequency variation which is much more typical of the expected rate than is the case with homicide. August has the highest frequency, July ranks second and the lowest frequency occurs in February, a winter month. These two offenses, closely related to each other, show approximately the same frequency variation except for the month of June where a sudden drop in the assault rate is indicated.

The offenses against property examined include robbery, burglary and larceny and auto theft. It is interesting to observe that these crimes show no consistency in maximum and minimum occurrence. The month of highest frequency for robbery is December; for burglary the frequencies in April and December are equally high; October is the high month in the case of larceny and January tops the list for auto theft. If we consider the months of lowest frequency, then June should be mentioned for robbery, October for burglary, February in the case of larceny and May for auto theft. This does not meet with common expectation at all, since larceny should be much more frequent in February if it is true that crimes against property increase in the winter.

There are several remaining problems. It should be considered here that the changing rise in population may make a considerable difference in the crime rate. Auto theft is also affected by the number of persons per capita who drive in any of these cities etc.

Turning now to time of occurrence only assault can be used as indication of crimes against the person, since homicide and rape are not reported by any police department as to the hour of occurrence. Assault is most frequent between 10 p.m. and 12 p.m. and occurs the least between 6 and 8 a.m. This is to be expected, since the former time is probably also the time when the heaviest drinking occurs, while the latter time is probably the hour when the least use of alcohol may be expected.

Robbery, burglary, larceny and auto theft were the crimes against property examined with reference to time of occurrence. Robbery occurs mainly between 10 and 12 p.m. reaching a low point between 10 and 12 a.m. Burglary is most frequent between 2 and 4 in the morning and least frequent between 8 and 10 a.m. Larceny reaches a maximum around 8-10 p.m. which is considerably earlier than is the case with robbery and burglary. Auto theft is high between 8 and 10 p.m. also, while the lowest auto theft rate occurs between 4 and 6 in the afternoon. The highest frequency of robbery to take place between 8 and 12 in the evening and that of burglary only a little later, i.e. from 12 midnight till 2 a.m. Larceny and auto theft both reach a maximum between 8 p.m. and 10 p.m.

Considering the average number of offenses that took place during a ten year period at a certain time to equal 100, the percentage of crimes committed by the hour may be charted with the result that robbery appears to be most frequent between 6 p.m. and 4 a.m., burglary between 6 p.m. and 6 a.m., larceny 12 p.m.-12 p.m. and auto theft 6 p.m. to 12 p.m. The only police department listing the frequency of offenses by the day of the week in the annual report is Cincinnati. Judging by the available statistics, Saturday is the leading day as to crime against the person. In five years, 1944-48, both criminal homicide and aggravated assault occurred most frequently on that day with Sunday as a close second. It is interesting to note that the increased frequency in assault begins on Friday and ends on Monday when an obviously different, mid-week low frequency begins. Homicide however, does not reach its weekend high until Saturday and continues through Monday at a high frequency. During the same five year period, the picture for crimes against property was about the same. Again the greatest frequency for all these offenses comes on Saturday and Sunday follows closely. Tuesday or Wednesday are the minimum crime days, but the frequency on these days is never low enough to make a significant difference if compared with the day immediately following or preceding the minimum day.

#### GENERAL CONCLUSIONS

1. Whereas crimes against the person consistently reach their maximum frequency in the summer, such crimes do not always increase or decrease with the temperature, as evidenced by the fact that criminal homicide is higher in December than in June and August.
2. Crimes against the person are at a minimum in the winter months.

3. Crimes against property do not always reach a maximum in the winter and a minimum in the summer. This may be observed primarily in the case of larceny.
4. There is a similarity between the time of greatest frequency of crimes against the person and crimes against property. The time of day when the largest number of offenses take place is about two hours before midnight to midnight.
5. Weekends have a greater crime frequency than mid week, for all offenses. The day of greatest frequency is Saturday.

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