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SOME ASPECTS OF CRIMINAL STATISTICS AND A STATISTICAL METHODOLOGY IN AREAS OF CRIMINAL LAW AND PROCEDURE

MELVIN F. WINGERSKY

Meanwhile, the science of statistics was being formed.

—BERNALDO DE QUIROS*

TO COLLECT reliable, valid and usable criminal statistics is a problem, persistent and difficult as ascertaining public opinion and attitudes concerning an imminent criminal trial or facets of the mores of a community. Advances in statistical methodology suggest some operational approaches to such matters.

“Unavailable,” responded several states¹ to the official questionnaire² issued, November 1949, by the Royal Commission on Capital Punishment, thereby impressively attesting to an utter paucity of statistical information about murder. Repetitive research explorations in other areas of criminal law invariably produce findings typified by that

*De Quiros, *Modern Theories of Criminology* 9 (Salvio trans., 1911).

¹ California, Connecticut, Michigan (limited answer), Missouri (qualified reply), New Hampshire, New York (partially answered), Wisconsin (answered in part). Replies to the Commission's questionnaire are reprinted in *Memoranda and Replies to a Questionnaire: II, United States of America*, Royal Commission on Capital Punishment, Cmd. 8, 932, at 737, et seq. (1952).

² Question 30, for example, sought a tabulation of data showing the number of murders known to the police and per one million of population for the 50-year period 1900–1948. *Ibid.*, at 739.

For a striking contrast see Appendix 3 to the Report of this Royal Commission, Cmd. No. 8,932, at 298 ff. (1953), containing an array of statistical tables pertaining to England, Wales and Scotland.

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single word answer. Despite frequent investigations, scarcity³ of data has continuously confronted researchers in domestic criminal law and frustrated projects on recidivism, the etiology and impact of crime. Scientific investigators have been forced to compute social profit or loss with inarticulated inventories.⁴

Robinson⁵ recognized this deficiency on the "statistical side" of American criminology in 1911. Tracing federal criminal statistics history from the first census collection of 1880 to the date of his pilot study, he took cognizance of the fact that prisons were the sole source of census figures of that era.

But what chiefly emerged from the 1890 census *Report on Crime, Pauperism and Benevolence in the United States* was an adumbration of the following obstacle:⁶

This classification (of crimes), like all other attempted classifications, is only partially satisfactory. The classifications in the criminal codes of the several states do not correspond with each other, and in a number of codes all attempt at classification has been abandoned. . . . Some of the offenses charged are not in any true sense of the word crimes.

A subsequent but comparatively early handbook, *Uniform Crime*

³ In his 1928 article, Sanford Bates directed his prefatory remarks to the common lament over "the dearth of Criminal Statistics," *Criminal Records and Statistics*, 19 *J. Crim. L. & Criminology* 8 (1928).

See also, Robinson, *Criminal Statistics in the United States*, 1 *J. Crim. L. & Criminology* 44 (1911). Valuable background material is to be found in this author's article, *History of Criminal Statistics*, 24 *J. Crim. L. & Criminology* 125 (1933). When Robinson wrote his note on *Criminal Statistics*, 4 *Encyc. Soc. Sci.* 579, 580 (Reprint ed., 1935), he stated that: "The collection of criminal statistics in the United States is still in the embryonic stage."

Consult A. M. Davies, *Uniform Classification of Offences*, 17 *A. B. A. J.* 215-19 (April, 1931).

Donald R. Taft, *Criminology, A Cultural Interpretation*, c. 2 (Rev. ed., 1950) presents a more recent account of parts of the problem.

⁴ Professor S. B. Warner, when writing the *Survey of Criminal Statistics in the United States*, for the National Commission on Law Observance and Enforcement, used the analogy of financial statements, 3 *Report on Criminal Statistics*, c. 1, at 28 (1931). It would seem this could be pressed even further, than in the foregoing text, because of the relationship between profit and loss statement and balance sheet. But what is important, to an overview of the problem, is Professor Warner's precept: ". . . criminal statistics are the indispensable tools of knowledge for any community that is attempting to reduce its crime and enforce its administration of criminal justice." *Ibid.*

Compare the observations of the following: Harry E. Barnes and Negley K. Teeters, *New Horizons in Criminology* 61 (2d ed., 1951); Harry Best, *Crime and the Criminal Law in the United States*, c. XXIII (1930); R. H. Beattie, *The Sources of Criminal Statistics*, 217 *Annals* 19 (1941).

⁵ Robinson, *History and Organization of Criminal Statistics in the United States* 1 (1911).

⁶ This statement, not quoted by Professor Robinson, appears in *U.S. Census, Part I*, at 139 (U.S. Dept. Interior, Census Office, 1890).

An example of realistic analysis was presented in the study of "Possible and Actual

Reporting,⁷ sponsored a methodology for collecting statistical information which echoed the ideas embraced by that quotation. Designers of that plan utilized uniform classification⁸ of offenses and a central⁹ collection agency as their thesis. And these two factors have continued to be integral parts of, and requirements basic to, producing usable national figures. But underlying this basic pattern is the sensitive area of local police reporting, on which pivots all accuracy of original returns. It was with full recognition of that threshold problem that *Uniform Crime Reporting* prescribed standard operating procedures. Written in the style of a field manual, it blueprinted operations requisite for collecting data at various police levels. Interpolation between the prescribed standard classification of offenses, for such reports, and state statutory provisions was to be accomplished under a tabulation of all state criminal statutes keyed by appropriate cross references to the uniform classification. It was a design to facilitate translating local offenses into the control catalogue of crimes.

Shortly after the publication of *Uniform Crime Reporting*, George W. Wickersham transmitted to the President, the third report of the National Commission on Law Observance and Enforcement, treating criminal statistics.¹⁰ The core of that report, "Survey of Criminal

Penalties for Crime" where it was noted, inter alia: "It is easy to compare the percentages of the total population in prison in different states, but such comparisons prove nothing as to the social and moral condition of the people without examination of the lists of punishable offenses in each of them; and these again prove nothing until the average duration of sentence for each group of crimes is also known." *Ibid.*, at 373, 374.

⁷ Published in 1929 by the Committee on Uniform Crime Records, International Association of Chiefs of Police. Dr. Robert H. Gault and J. Edgar Hoover were members of the advisory committee, and Professors Raymond Moley, Louis N. Robinson, Thorsten Sellin, E. H. Sutherland, Sam B. Warner, and Dean John H. Wigmore were among the galaxy of contributors.

It is of interest, here, to recall that the minutes of the Executive Board of the Institute of Criminal Law and Criminology for September 27, 1922, show that Prof. S. B. Warner had been "retained by the committee as its expert on criminal records and statistics." 13 *J. Crim. L. & Criminology* 325 (1922).

⁸ *Uniform Crime Reporting* at 4, and 19 and more particularly Chap. V.

⁹ This same general suggestion was subsequently endorsed by the Wickersham Commission as being a recommendation made by Prof. L. N. Robinson "as long ago as 1910." 3 *National Commission on Law Observance and Enforcement, Report on Criminal Statistics* 89 (1931).

In this connection, see C. C. Van Vechten, *Central State Bureaus for the Collection of Criminal Statistics*, 31 *J. Crim. L. & Criminology* 69 (1940).

A sidelight, for contrast, appears in an article by O. K. Sagen, *Production of Vital Statistics As a Combined Federal-State Operation*, 7 *American Statistician* 16 (1953).

¹⁰ The chairman's letter of transmittal is dated April 1, 1931. This was Report No. 3 in the Commission's series. *National Commission on Law Observance and Enforce-*

Statistics in the United States" was authored by Professor Sam B. Warner¹¹ who had participated in the prior project culminating with *Uniform Crime Reporting*.

Nearly twenty years after Robinson's appraisal, Wickersham's group indicated concurrence in prior findings by asserting¹²: "Crime statistics that is, statistics of offenses of various sorts that are known to the police, are for practical purposes, *non-existent in the United States*." Professor Thorsten Sellin, wrote euphemistically, in his memorandum¹³ to the Royal Commission on Capital Punishment, when he capsuled the description of the situation then prevalent, as: ". . . criminal statistics are poorly developed in the United States." At least the views¹⁴ entertained by respectable authorities are consistent though the condition remains pathetic.

ment, Report on Criminal Statistics (1931). Morris Ploscowe's paper, A Critique of Federal Criminal Statistics, forms an integral part of the Report. *Ibid.*, at 148 ff.

A bibliography (1923-1930) on certain aspects of criminal statistics is contained in the main body of the Report. *Ibid.*, at 9 ff.

See Sellin, Report on Criminal Statistics, 18 A.B.A.J. 309 (1932) for a description of Report No. 3. For another view of this report see A. M. Davies, Criminal Statistics and The National Commission Report, 22 J. Crim. L. & Criminology 357 (1931).

¹¹ See S. B. Warner, Crimes Known to the Police—An Index of Crime?, 45 Harv. L. Rev. 307 (1931) for consideration of the problem of comparability in the setting of prosecutions under different statutory definitions.

¹² 3 National Commission on Law Observance and Enforcement, Report on Criminal Statistics 87. The reliability of this appraisal is demonstrable by myriad factors, e. g., methods used in collecting information for its Report coupled with evidence adduced and traced therein. *Ibid.*, at 30.

¹³ 30 Royal Commission Minutes of Evidence, Cmd. 8,932, at 649 (1951). This memorandum, rich mine of information that it is, should be examined against the background of Professor Sellin's testimony before the latest Royal Commission on Capital Punishment. *Ibid.*, at 671 ff.

¹⁴ Many other studies were published on facets of this problem, among which were: Koren, Report of the Committee on Statistics of Crime, 1 J. Crim. L. & Criminology 417 (1911); E. Abbot, Recent Statistics Relating to Crime in Chicago, 13 J. Crim. L. & Criminology 333 (1922); Criminal Justice in Cleveland, Reports of the Cleveland Foundation Survey of the Administration of Criminal Justice in Cleveland, Ohio (1922); Comments made by Mr. Justice Harlan F. Stone in his review of Criminal Justice in Cleveland, on the statistical method of dealing with social problems, 35 Harv. L. Rev. 967 (1922), is of interest here; Increase in Murder in the United States, 17 J. Crim. L. & Criminology 466 (1926); note, appropriately labeled Lack of Criminal Statistics, 17 J. Crim. L. & Criminology 474 (1926); an article by R. Moley, Collection of Criminal Statistics in the United States, 26 Mich. L. Rev. 747 (1928) brings into focus the term "crime complaint statistics," for perhaps the first time at this stage; a note, For Uniform and Accurate Crime Statistics, 14 A.B.A.J. 564 (1928) brought home to the bar, in general, the problem of identity of offenses and differences in statutory definitions in connection with the problem of uniform classification of major offenses; F. A. Knoles, The Statistical Bureau, a Police Necessity, 19 J. Crim. L. & Criminology 383 (1928); Criminal Statistics and Identification

Again, in the Wickersham Survey,¹⁵ "police departments, courts, probation officers, penal institutions and parole boards" were itemized as the main areas in which to collect basic data. Stressing the necessity for comparability in criminal statistics, emanating from various states, this Survey envisaged aid from, and action by, the federal government to attain the objective. But this postulation, that police departments constitute one of the main sources of such data, should be examined on a slide with the caveat¹⁶ constantly reiterated in *Uniform Crime Reports*,¹⁷ issued by the Federal Bureau of Investigation:

In publishing the data sent in by chiefs of police in different cities, the F.B.I. does not vouch for their accuracy. They are given out as current information which may throw some light on problems of crime and criminal-law enforcement.

These words were singled out and read by Mr. Justice Jackson in his address¹⁸ to the Criminal Law Section of the American Bar As-

of Criminals, Report Submitted to the National Crime Commission, 19 J. Crim. L. & Criminology 36 (1928); Fraenkel, Some Suggestions for State Action in Securing Standardized Criminal Statistics, 19 J. Crim. L. & Criminology 99 (1928); H. A. Phelps, Frequency of Crime and Punishment, 19 J. Crim. L. & Criminology 165 (1928); Sam B. Warner, Creating a Plan for Criminal Court Statistics, 14 J. Am. Jud. Soc. 88 (1930); Thorsten Sellin, Basis of a Crime Index, 22 J. Crim. L. & Criminology 335 (1932).

¹⁵ National Commission on Law Observance and Enforcement, Report on Criminal Statistics 25.

¹⁶ Prof. S. B. Warner focused attention on this feature of the Uniform Crime Reports Bulletin for November, 1931, in his note on "crimes known to the police," 45 Harv. L. Rev. 533 (1932). He commented that such a qualification tended to indicate that the department of justice had lost confidence in the accuracy of these figures.

¹⁷ E.g., 24 Uniform Crime Reports 64 (1953). Underscoring as it appears in original source. The same proviso appeared in the Annual Bulletin for 1952 in 23 Uniform Crime Reports 119.

These Reports are issued by the Federal Bureau of Investigation and "Advisory" appears in each title page as does the legend "International Association of Chiefs of Police." Crimes characterized as exclusively federal are excluded; only local offenses are reported.

¹⁸ Justice Robert H. Jackson, *Serving the Administration of Criminal Justice*, 17 Fed. Probation 3, 5 (1953). Address in Boston, Massachusetts, August 26, 1953. With reference to the American Bar Association's Special Committee on the Administration of Criminal Justice, headed by the Justice, he said: "We are not trying to find out why people commit crimes." *Ibid.*, at 5.

In Justice Frankfurter's testimony before the latest Royal Commission on Capital Punishment appears this proposition: ". . . Statistics, I am trying to say, could, in the nature of the problem, furnish only limited information regarding the ultimate issue of deterrence. The number of variables is enormous. But none of those materials are now available . . ." 26 Royal Commission Evidence, Cmd. 8,932, ¶ 8009, at 584 (1950).

sociation, as illustrative of the necessity thrust upon the F.B.I. to warn everyone concerning the data contained in *Uniform Crime Reports*. It is interesting to note that when describing the possible choice of states to be studied by the Committee on the Administration of Criminal Justice, headed by the Justice, it was observed,¹⁹ inter alia: "The availability of statistical materials concerning their administrations of justice may have some bearing on the selection."

Criminal statistics, long since atrophied,²⁰ received some stimulation from this competent Survey. But palliation of that condition was eliminated when the Bureau of the Census discontinued collecting state judicial criminal statistics in 1946. Dr. Alpert²¹ assigned seven limitations, of this series on judicial criminal statistics, as underlying causes for its "demise": ". . . (1) incomplete and inadequate coverage, (2) narrow scope of the data collected, (3) lack of comparability, (4) questionable reliability, (5) improper presentation, (6) insufficient analysis and interpretation, and (7) absence of timeliness." Implicit in his diagnosis are the same symptoms²² which were described by the precursors as inhibiting useful collections of data. But Alpert's indictment need not be confined to contemporary affairs. For it ap-

¹⁹ Criminal Justice: The Vital Problem of the Future, 39 A.B.A.J. 743, 744 (1953), a preliminary statement by the Special Committee of the American Bar Association mentioned in note 18 supra. It is not amiss to note another comment contained in that article: "It is common knowledge that there is a startling discrepancy between the number of crimes committed and the number ever punished. . . ." Ibid., at 743.

²⁰ See e.g., E. Frankel, An Integrated System of Crime Statistics, 9 Fed. Probation 28 (1945); An Index of Crime by States: Changes from 1937-1939 to 1946, 37 J. Crim. L. & Criminology 528 (1947).

"Crime statistics are kept variously and inaccurately or are not kept at all," from the study of Youth and Crime by Dorothy W. Burke (U.S. Dept. of Labor, 1930).

"A study was made of criminal statistics in California. It was discovered at the outset of the commissions work that criminal statistics in California, as elsewhere in the nation, were characterized by insufficiency of information, unreliability and incomparability. . . ." Final Report of the Special Crime Study Commission on Social & Economic Causes of Crime & Delinquency 7 (1949). See also *ibid.*, at 17 for recommendations regarding statistics.

"While extensive use is made of statistics, research in criminology is greatly handicapped in the United States by inadequate statistical data." M. B. Clinard, *Sociologists and American Criminology*, 41 J. Crim. L. & Criminology 549, 571 (1951).

²¹ Dr. Harry Alpert, National Series on State Judicial Criminal Statistics Discontinued, 39 J. Crim. L. & Criminology 181 (1948). Here is an article well deserving of rereading.

²² Dr. Alpert particularly stresses the familiar defects, e.g., lack of uniformity in reporting and comparability of data. *Ibid.*

pears that when Garofalo²³ retreated from the desideratum of international tabulations of crime he attested to several obstacles including absence of uniform statistical methods and variations in criminal laws. Against the foregoing background, Professor Thorsten Sellin²⁴ again sought to develop criminal statistics, which he properly characterized as an "indispensable tool and source for information." His concrete proposal was the Uniform Criminal Statistics Act.²⁵ This legislation envisages a Bureau of Criminal Statistics, in each state, as the central collection agency at that level. Uniformity to be attained through broad powers conferred upon the director of each bureau. Perhaps history provides a little comfort, in this zone of endeavor, since Professor Radzinowicz has reported²⁶ that Bentham's suggestion to establish criminal statistics was delayed 30 years until Romilly (*ed.*: who, as Phillipson²⁷ records, was an advocate of judicial criminal statistics) activated it by an appropriate motion in parliament.

²³ There is a striking similarity between the factors enumerated by Garofalo, *Criminology*, 436 (Millar transl., 1914) as preventing comparisons of statistics about crime, and those itemized by American scholars.

²⁴ Prof. Thorsten Sellin, *The Uniform Criminal Statistics Act*, 40 *J. Crim. L. & Criminology* 679 (1950). Once more the case for criminal statistics is skillfully presented coupled with capable argument in support of centralization. A brief, but tragic account of the Uniform Criminal Statistics Act of 1937 is also related in this paper.

"Unless a uniform state law, governing the features for which a general body of nationwide statistics is desirable, can be had in the near future, embarrassment will follow from the multiplicity of State systems . . ." 3 National Commission on Law Observance and Enforcement, *Report on Criminal Statistics* 7 (1931).

Cf. Thorsten Sellin, *Significance of Records of Crime*, 67 *L. Q. Rev.* 489 (1951). Dr. Pollak cites Sellin, *Research Memorandum on Crime in the Depression* (N.Y.: Soc. Sci. Research Council, 1937) in that portion of his own article, *The Errors of Justice*, captioned "Criteria of Reliable Reporting," 284 *Annals* 115, 122 (1952).

²⁵ *Ibid.*, at 684 ff. This Act was approved by the American Bar Association, November 2, 1946.

Conceivably both the Model Department of Justice Act and Model Police Council Act sponsored by the American Bar Association could eventually strengthen the Uniform Statistics Act. I *Organized Crime and Law Enforcement* 149 (1952). These are embodied in the Report by and Research Studies Prepared for the American Bar Association Committee on Organized Crime.

²⁶ L. Radzinowicz, *A History of English Criminal Law and Its Administration from 1750*, at 395 (1948), where a short account of Bentham's early study "A View of the Hard-Labour Bill" brings into focus the use of "data." Authority for the statement in the above text, of this article, is found, *ibid.*, at 395, n. 51.

²⁷ Coleman Phillipson, *Three Criminal Law Reformers, Beccaria, Bentham, Romilly* 315 (London, 1923).

By way of history it should be also noted that in 1871 the National Police Association resolved "to procure and digest statistics for the use of police departments." *Uniform Crime Reporting* 1. And the National Conference on Criminal Law and Criminology

Some vitality for opinions favoring criminal statistics springs from viewing crime as a social product.²⁸ Those authorities who have inveighed against the defection in such statistical materials, implement their polemics with postulations concerning usefulness of such data, if obtainable and valid. An array of valid data is envisaged by the Wickersham report as a potential source for providing information about the characteristics of offenders, number and type of offenses, and "the measures taken by society in dealing with offenders."²⁹ But a limit on permissive inferences which may properly be drawn from these statistics has been delineated by Professor Sellin as follows: "This does not mean that criminal statistics can be used to discover the roots of the individual offender's conduct, for this demands other and finer diagnostic instruments. Nevertheless, statistical study of the offender in the mass has obvious social utility."³⁰ Positing his argument on the relatively constant ratio between known and unknown crimes, Bonger³¹ sought to repel challenges launched against the use of criminal statistics for studying the etiology of crime. His premise brings into clear relief that ever-present hiatus between crimes known to the police authorities and those never reported or otherwise un-

adopted as a resolution in 1909, "That the conference urge upon Congress to provide for the collection, through the agency of the Census Bureau of criminal and judicial statistics, covering the entire United States as early as possible." 3 National Committee on Law Observance and Enforcement, Report on Criminal Statistics 8 (1931).

²⁸ Saleilles, *The Individualization of Punishment* 4 (Jastrow transl., 1911). But compare Tarde, *Penal Philosophy*, § 58, at 295 (Howell transl., 1912), who asserts that statistics were used by the "new school" to find "natural laws of crime." Here, Tarde is challenging anthropological ideas and comparing sociological and biological interpretations of statistics.

"Criminal statistics are for criminal sociology what histology is for biology." Ferri, *Criminal Sociology* 168 (Kelly transl., 1917).

²⁹ 3 National Committee on Law Observance & Enforcement, Report on Criminal Statistics 25. See also *ibid.*, at 36 ff. for an extended description of the value of statistics concerning arrests, offenses, clearances, probation, et seq.

³⁰ Thorsten Sellin, *The Uniform Criminal Statistics Act*, 40 *J. Crim. L. & Criminology* 679 (1950).

Compare: "Now, let us not yield to the belief that statistics themselves solve problems," from the context of an address by Mr. Justice Jackson to the Criminal Law Section of the American Bar Association, 17 *Fed. Probation* 3, 5 (1953).

³¹ W. A. Bonger, *Criminality and Economic Conditions* 84 (Horton transl., 1916). Chapter II, *The Statisticians*, is of obvious pertinency to this current article. The chapter ranges from A. Quetelet to H. Muller and is supported by numerous tables and graphs.

Radzinowicz and Turner, co-authors of *The Meaning and Scope of Criminal Science*, in *The Modern Approach to Criminal Law* 13, (Radzinowicz and Turner, eds., 1948) report that A. Quetelet is generally regarded as the founder of criminal statistics.

known. Accordingly, most respectable tabulations carry a caption, at least for the initial column, indicating that the figures reported are based upon cases (or specifically named crimes) "known to the police."³² However, Radzinowicz takes issue with A. Quetelet's supposition that the percentage of crimes committed and unreported is constant. Predicated on various factors usually determinative of which crimes will be reported, Radzinowicz flatly states³³ that: ". . . the percentage of crimes reported is not always the same." While of course this comment dips into the area of evaluation it is not offered in total rejection of statistics. Quite the contrary, the goal of that author is to improve³⁴ criminal statistics in England.

Putting to one side those shortcomings³⁵ already outlined, there appears to be a blurring of terminology descriptive of various statistics available in areas of criminal law. In the Wickersham Report several different kinds of statistics are mentioned which indicate their sources, viz: police, court, adult probation, institution and trial court statistics. Criminal statistics is an umbrella term for all variety of data collections made in the enforcement and administration of criminal law. Contours of an outline of such sources are ordered by an offender's administrative and judicial processing, commencing with police activities and flowing through courts to institutions. These stages lend themselves to several groupings showing where data potentials exist. At the investigative stage, prior to apprehension, complaints by victims, reports of witnesses, discovery by inspection of patrolled areas

³² Much has been written on this facet of the problem. See, e.g., 3 National Committee on Law Observance and Enforcement, Report on Criminal Statistics 33 and 37. See Note 16 *supra*.

Cf., "Few States record the number of murders known to the police." Royal Commission on Capital Punishment, 1949-1953, Report, Cmd. 8,932, at 346.

See, O. W. Wilson, *Police Administration* (1950) and *Police Records* (1942) for suggestions on methods useful to police record keeping.

³³ L. Radzinowicz, *English Criminal Statistics, A Critical Analysis*, in *The Modern Approach to Criminal Law*, Chap. XII, at 174, 176 (Radzinowicz and Turner, eds., 1948).

Cf., E. H. Sutherland & C. C. Van Vechtin, Jr., *Reliability of Criminal Statistics*, 25 *J. Crim. L. & Criminology* 10 (1934), an article which focuses attention on unverified statements of prisoners as the threshold of collecting data.

³⁴ Cf., Ferri, *Criminal Sociology*, § 113, at 174 (Kelly transl., 1917).

³⁵ To which might be added: "We have no quantitative measurements for the country as a whole and but imperfect ones for a few states. . . . Nowhere is there a competent state bureau charged with the collection and distribution of criminal statistics. This is a painful statement and particularly because it has so often been repeated that one is fairly sick of it." Koren, *Things We Don't Know About Crime*, 13 *J. Crim. L. & Criminology* 446, 450 (1922).

give rise to figures on crimes made known to the police. Apprehension suggests the accusatory stage where, on the police level, data concerning arrest on view and with a warrant would be relevant as would be grand jury action via true bills and no bills. It is at this juncture that temporary detention parallels apprehension and interim release for example may be effected by the police, on bail, by writ of habeas corpus or temporary commitment due to mental condition. Preliminary examination and arraignment bring into play other variables affecting statistics collected at these stages. Dispositions might be accounted for on several grounds, i.e., pleas of guilty, pleas of guilty to lesser offenses, insanity, nolo contendere. While at the trial level, where the merits are heard, cases may result in verdicts of conviction by a judge, sitting without a jury, by a jury or in judgments of acquittal in non-jury trials or by juries or disagreement of jurors. Here too, nolle prosequi could terminate a proceeding. The entire range of penalties from death to sentences for a term, indeterminate sentences, suspended sentences, fines and probation lend themselves to a separate section. While affirmance, reversal, acquittals and other action by reviewing tribunals suggest another stage. Institutional detention pursuant to sentence stands alone as does parole. The prerogatives of commutation, executive clemency and presidential pardon could be classed separately. None of these are airtight compartments and certain of them overflow into the other.

Variables affecting statistics of crime and offenses are present on these various levels. Thus an offense precipitating arrest may be changed in grade by indictment and result in a conviction for a crime different from the one for which the offender was originally booked. So too, an offender may plead guilty to a lesser offense than the one first lodged against him at a police station. Penalties may vary due to bargaining by prosecutors in exchange for pleas of guilty. There may exist considerable disparity in sentences,³⁶ based on identical statutory provisions, between courts of equal rank, but geographically separated within the same state. Temporary detentions vary in duration, for myriad reasons, and might be voluntarily terminated by the police, or by writ of habeas corpus; pre-sentence detention may be pro-

³⁶ "The wide variability in the operation of the sentencing process in our criminal courts has become a matter of common knowledge, attested by a number of statistical researches." *Habitual Offender Laws and Sentencing Practices, I Organized Crime and Law Enforcement* 149 (1952) (The Report By and Research Studies Prepared For The American Bar Assoc. Comm. on Organized Crime.)

longed due to inability to furnish bail and bail may be exorbitant. Similarly, *nolle prosequi* can be exercised at several of the different stages. Numerical inventory of "convictions" may include dispositions on pleas of guilty. These are not intended as an exhaustive list of permutations and combinations. But they suffice to illustrate that from the first report of crime made known to the police to the time of final disposition, there is a constant barrage of variables to be considered in evaluating and reporting such statistics. Without a doubt, as it has been observed, gathering of reliable and usable data is expensive and exceedingly difficult. Without a central authority to demand such information in a specified form and power to insist that the prescribed form be utilized, conjecture and memory will underlie national figures and those reported on and from various other levels.

Many writings concerning criminal statistics are limited to various aspects and elaborations of those matters previously pointed out, or espouse views on the usefulness of such statistics. At least this was a typical cant of articles published prior to World War II. But statistical methodology significantly developed under the impact and demands of the war effort. Statistical sampling,³⁷ as a method of obtaining valid data, was among certain analytical tools which received such impetus and has emerged as a practical procedure for collecting reliable data. Its potentialities in the field of criminal law merit consideration.

As an integral part of their committee report on *Sexual Behavior in the Human Male*, Professors Cochran, Mosteller and Tukey,³⁸ described some principles of sampling relevant here:

Whether by biologists, sociologists, engineers, or chemists, sampling is often taken too lightly. In the early years of the present century, it was not uncommon to measure the claws and carapaces of 1000 crabs, or to count the number of veins in each of 1000 leaves, and to attach to the results the probable error which would have been appropriate had the 1000 crabs or the 1000 leaves been drawn at random from the population of interest. If the population of interest were all crabs in a wide-spread species, it would be obviously almost impossible to take a simple random sample. But this does not bar us from honestly assessing the likely range of fluctuation of the result. Much effort has

³⁷ See, e.g., Deming, *Some Theory of Sampling, Part 1, The Specification of Reliability Required*, at 1ff. (1950).

³⁸ William G. Cochran (John Hopkins Univ.), Frederick Mosteller (Harvard Univ.), and John W. Tukey (Princeton Univ.), *Statistical Problems of The Kinsey Report*, 48 *J. Am. Statistical A.* 673 (1953).

These scholars, hereinafter referred to as CMT, were appointed in 1950 as a committee of the Commission on Statistical Standards of The American Statistical Association to review the statistical methods used in Kinsey, Pomeroy and Martin, *Sexual Behavior in The Human Male* (W. B. Saunders Co., 1948).

been applied in recent years, particularly in sampling human populations, to the development of sampling plans which, *simultaneously*, (i) are economically feasible, (ii) give reasonably precise results, and (iii) show within themselves an honest measure of fluctuation of their results. Any excuse for the practice of treating non-random samples as random ones is now entirely tenuous. Wider knowledge of the principles involved is needed if scientific investigations involving samples (and what such investigation does not involve samples?) are to be solidly based. Additional knowledge of techniques is not so vitally important, though it can lead to substantial economic gains.³⁹

This committee's report, emanating from the American Statistical Association, is a substantial contribution to the literature and knowledge on statistical or methodological problems similar to those encountered and underlying the research project producing *Sexual Behavior in The Human Male*. Of particular significance here, is the suggestion sponsored by the committee that:⁴⁰ "A probability sampling program should be considered by KPM,"⁴¹ and their recommendation of "a step by step program starting with a very small pilot study. . . ."

A communication by Dr. Kinsey to that committee must stand here, at least, as an answer to a natural vein of inquiry concerning the impact, if any, on the latest volume, *Sexual Behavior in The Human Female*,⁴² of those conclusions and recommendations they made on the earlier research project. Dr. Kinsey advised⁴³ the Association that all data for *Sexual Behavior in The Human Female* had been gathered and punched cards⁴⁴ were being processed when the com-

³⁹ Cochran, Mosteller and Tukey, *Statistical Problems of The Kinsey Report*, 48 J. Am. Statistical A. 673, 688 (1953).

⁴⁰ *Ibid.*, at 676.

⁴¹ This abbreviation is used throughout the committee's report in reference to the book (*Sexual Behavior in the Human Male*) and to designate its authors Kinsey, Pomeroy and Martin.

⁴² Alfred C. Kinsey, Wardell B. Pomeroy, Clyde C. Martin, Paul H. Gebhard, *Sexual Behavior In The Human Female* (1953).

⁴³ Cochran, Mosteller and Tukey, *Statistical Problems of the Kinsey Report*, 48 J. Am. Statistical A. 678 (1953) reproducing a portion of Dr. Kinsey's letter to the committee, wherein it was put this way: "While the recommendations of the committee may modify further work, it can affect this forthcoming volume only in the form in which the material is presented, the limitations of the conclusions, and the careful description of the limitations of our methods and conclusions."

⁴⁴ Earnest Albert Hootin, *The American Criminal, An Anthropological Study*, in 1 *The Native White Criminal of Native Parentage* (1939). Professor Hootin discusses statistical methods employed in his work even to the extent of illustrations showing punched card sorting machines.

mittee was invited to review his studies on the human male, adding that while their recommendations might modify further work the effect on the then forthcoming volume would be limited to certain specified matters.

Of course there is a dual aspect in the pertinency, here, of both Kinsey reports, illustrating as they do, facets of statistical methodological problems while presenting substantive findings in the areas investigated. Though an evaluation of Dr. Kinsey's reported findings is beyond the province and purpose of this article, it is important to take cognizance of his contributions as a springboard for further investigations to implement, for example, legislative programs⁴⁵ where the early struggle for an opinion was impaired by want of valid and reliable data.

Probability sampling as a method for collecting data is described in the volume about the human female. While KPM did not use probability sampling in their research on the human female they devote a considerable portion of this latest report to an exposition of that statistical technique, stressing particularly the increasing use of probability samples in surveys. Technical reasons assigned by KPM for not employing⁴⁶ probability sampling in their second project were somewhat anticipated by the Committee report, previously mentioned. But difficulties encountered in probability sampling surveys because of nonresponse and refusal are no longer ineluctable.

A recent article by Dr. W. Edwards Deming, *On A Probability Mechanism To Attain An Economic Balance Between The Resultant*

⁴⁵ A good example of such matters is reported in Commitment and Release of Sexual Deviates, published in June, 1951. Illinois Legislative Council Publication 103. This is a research report prepared pursuant to Proposal 296 by Senator William J. Connors. Thus, it is observed, in the preview portion of this Report: "An initial problem in framing such legislation stems from the difficulty in defining and detecting the type of deviated or abnormal sexual behavior which is considered serious enough to warrant the special disposition and treatment contemplated by these acts." *Ibid.*, at 1.

For a similar discussion see Wechsler, *The Challenge of A Model Penal Code*, 65 *Harv. L. Rev.* 1097, 1118 (1952). For a comparison of statutes dealing with Psychopathic Sexual Offenders See Appendix A, of Report No. 9, *Psychiatrically Deviated Sex Offenders* (1949), formulated by the Committee on Forensic Psychiatry of the Group for the Advancement of Psychiatry. The comment, *Proposed Revisions in the Illinois Criminal Code*, 48 *Northwestern Univ. L. Rev.* 198 (1953) presents a blueprint of some considerations basic to a legislator's intellectual arsenal requisite in facing up to legislation on sex offenses. See also: Kinsey, Pomeroy, Martin, Gebhard, *Concepts of Normality And Abnormality in Sexual Behavior, Psychosexual Development in Health and Disease* 11 (1949).

⁴⁶ Kinsey, Pomeroy, Martin and Gebhard, *Sexual Behavior in the Human Female* 25.

Error of Response and The Bias of Non Response,⁴⁷ reports the results of his research and study of “. . . the evidence produced by a proposed mechanism that will give rise to a calculable variance, to a calculable bias of nonresponse, and to a calculable cost; . . . on the basis of this mechanism to make a determination of the number of recalls that are required to reach a desired accuracy at minimum costs.” In this paper Dr. Deming supplies, inter alia, a theory of bias to implement sampling theory. And, for example, this latest report considers a typical practical situation where: “We assume that under the conditions specified for any particular survey, failure to obtain an interview may arise from a multitude of causes, which are manifest as not at home and refusal. We assume that people that refuse are of two kinds, those that give permanent refusals and those that give temporary refusals. . . .”

In a personal communication from Dr. Deming to the author of this law review article, an aspect of the apparatus of ideas, implicit in the foregoing study, was somewhat expanded by this passage:

The danger in the quota system is that the interviewer must exercise judgment in selection. Whatever be the area, age, sex, occupation, or race, of the respondent, he was selected by the interviewer, for some reason, from other people who could have met the same requirements for the quota. . . . To show the possible dangers in this sample (ed.: quota), one need only mention the problem of nonresponse—i.e., the failure of some people to respond, either through sheer outright preference not to talk, or through inconvenience at the particular moment, or through not being at home. In almost every complete coverage an interviewer encounters a certain amount of nonresponse. Repeated calls must therefore be built into the plans. Even then, there is often a stubborn residual, which may require extreme care in interpretation.

A probability sample picks up its proper share of nonresponse, and in modern practice, a sampling plan contains provisions for repeated calls. In contrast, a quota selection avoids the issue of nonresponse altogether, and it makes no correction therefor. The uncertainty that arises from selecting people who are ready and willing to talk might well throw the percentages one way or another by enough to change the conclusions.

It is unnecessary to discuss the solution sponsored by Dr. Deming in a law review article because its citation here is merely to establish rapport with the statistician, more particularly to show that statistical problems confronting researchers in the myriad areas of criminal law

⁴⁷48 J. of Am. Statistical A. 743, 745, 747 (1953). Dr. W. Edwards Deming is one of the outstanding international authorities on sampling. He is the author of numerous papers, articles, and treatises on statistical sampling, including a major work, *Some Theory of Sampling* (Wiley & Sons, Inc., 1950). The latter treatise is referred to in *Sexual Behavior in the Human Female*, at 24 ff., n. 1 and n. 2.

are not insuperable. This is of moment, here, because the "wide use of probability only commenced in recent years."⁴⁸

Cogeneity and validity of CMT's observations on probability sampling recommends its quotation⁴⁹ at this juncture:

When probability samples are used, inferences to the population can be based entirely on statistical principles rather than subject-matter judgment. Moreover, the reliability of the inferences can be judged quantitatively. A probability sample is one in which

- (i) each individual (or primary unit) in the sampled population has a known probability of entering the sample,
- (ii) the sample is chosen by a process involving one or more steps of automatic randomization consistent with these probabilities, and
- (iii) in the analysis of the sample, weights appropriate to the probabilities (i) are used.

Contrary to some opinions, it is *not* necessary, and in fact usually not advisable in a pure probability sample for

- (i) all samples to be equally probable, or
- (ii) the appearance to one individual in the sample to be unrelated to the appearance of another.

There are few reported decisions in which such statistical methods have been subjected to judicial scrutiny. Because of this scarcity it is necessary to present several civil cases, though this article concerns criminal law. At least these civil cases are illustrative of judicial reaction to the statistical matters under consideration here.

An appeal in *United States v. 88 Cases, More or Less, Containing Birely's Orange Beverage*,⁵⁰ from a decree of condemnation grounded on a finding of economic adulteration under § 402(b)(4) of the Federal Food Drug and Cosmetic Act,⁵¹ evoked some observations in the Third Circuit concerning admissibility of surveys at the trial level. Though the reviewing court vacated the decree of condemnation, on other grounds, it held that the government's survey evidence was properly received. These surveys compared responses made by approximately 3539 persons to questionnaires, prepared by the government, for demonstrating reactions of householders and the general public when shown a Birely's bottle. Following this decision, results

⁴⁸ From a paper read by Dr. W. Edwards Deming at the December, 1952, meeting of the American Statistical Association in Chicago, Illinois.

⁴⁹ Cochran, Mosteller and Tukey, *Statistical Problems of the Kinsey Report*, 48 J. Am. Statistical A. 673, 691 (1953).

⁵⁰ 187 F. 2d 967 (C.A. 3d, 1951) cert. denied 342 U.S. 861. "The technical adequacy of the surveys was a matter of the weight to be attached to them."

⁵¹ 52 Stat. 1046-47 (1948); 21 U.S.C.A. § 342(b)(4) (1946).

of a public recognition survey were admitted in evidence to show "secondary meaning" in *Household Finance Corporation v. Federal Finance Corporation*.⁵²

But a trial court's rejection of a public opinion poll, so-called, tendered in support of a motion for change of venue, was sustained by the Supreme Court of Florida when it reviewed *Irvin v. State*.⁵³ On a prior appeal⁵⁴ this same court upheld Irvin's conviction of rape, thereafter certiorari was granted, and its judgment reversed, per curiam, by the United States Supreme Court.⁵⁵ Certain conditions and events reported in the concurring opinion, written by Mr. Justice Jackson with whom Mr. Justice Frankfurter joined, probably stimulated the defense's attempted use of this public opinion poll when the case reached the trial level for the second time.

Some support for this observation stems from the following description in that concurring opinion, of the environment when Irvin was first tried in September, 1949:

⁵² 105 F. Supp. 164 (D. Ariz., 1952); See: 17 J. Marketing 289 (1953).

The following New York case records an example of judicial reaction to random sampling and probability. Evidence was introduced to show public understanding of the terms: savings, thrift and compound interest. Objection to admissibility evoked these observations by the trial judge:

"A party endeavoring to establish the public state of mind on a subject which state of mind cannot be proved except by calling as witnesses so many of the public as to render the task impracticable, should be allowed to offer evidence concerning a poll which the party maintains reveals that state of mind. The evidence offered should include calling the planners, supervisors and workers (or some of them) as witnesses so that the Court may see and hear them; they should be ready to give a complete exposition of the poll and even its results; the work sheets, reports, surveys and all documents used in or prepared during the poll-taking and those showing its results should be offered in evidence, although the Court may desire to draw its own conclusions. In this trial the learned counsel for defendant adduced proof of the kind to which I have just referred. I think that the proof as to the poll should be received in evidence. I also am satisfied that the conclusions drawn therefrom are worthy of some consideration. Plaintiff's objections to the admission of their proof are overruled."

From the first opinion in *People v. Franklin National Bank of Franklin Square*, complaint dismissed on merits, 200 Misc. 557, 105 N.Y.S. 2d 81 (1951) rev'd 281 App. Div. 757, 118 N.Y.S. 2d 210 (1953), modified and aff'd 305 N.Y. 453, 113 N.E. 2d 796 (1953), rev'd sub nom. *The Franklin National Bank of Franklin Square v. People of the State of New York*, No. 427, United States Supreme Court, April 5, 1954.

⁵³ 66 So. 2d 288 (Fla., 1953).

⁵⁴ *Samuel Shepherd and Walter Irvin v. State of Florida*, 46 So. 2d 880 (1950). Irvin was indicted on July 20, 1949, for rape allegedly committed July 16, 1949; trial was set for August 29, 1949. Rehearing on its opinion was denied by the Supreme Court of Florida, July 5, 1950.

⁵⁵ *Samuel Shepherd and Walter Irvin v. State of Florida*, 341 U.S. 50 (1951). "Per Curiam. The judgment is reversed. *Cassell v. Texas*, 339 U.S. 282."

But prejudicial influences outside the courtroom, becoming all too typical of a highly publicized trial, were brought to bear on this jury with such force that the conclusion is inescapable that these defendants were prejudged as guilty and the trial but a legal gesture to register a verdict already dictated by the press and the public opinion which it generated.⁵⁶

After a new indictment, and prior to trial, defense counsel successfully moved for a change of venue, in 1953, from Lake County where Irvin had been previously tried. It is with his subsequent and latest motion to change venue, from Marion County, to which his second case had been ordered for a new trial, that the Florida Court treated with the proffered poll of public opinion.

In substance, it was asserted on Irvin's behalf that his deprivation of a fair and impartial trial stemmed from the trial judge's refusal to admit testimony, allegedly implementing the motion for change of venue, from a defense witness described as "A Research Executive with the Elmo Roper Research and Public Opinion Organization." This witness narrated his experience in conducting surveys "to determine the attitude of the American people on varied subjects."⁵⁷ From the Florida opinion it appears that the questionnaire destined for Florida was given an out-of-town try out⁵⁸ in Jacksonville and environs. After its testing this questionnaire was revised in Roper's New York office for future use in Lake County, site of the crime and in Marion County, proposed locus of second trial, and in the far removed Counties of Gadsen and Jackson.

Arbitrary numbers of 500 white persons in Lake and Marion Counties, and 250 in Gadsen and Jackson were selected for interview. "It was decided" to call on 150 Negroes in Marion and Lake Counties,

⁵⁶ *Ibid.*, at 51.

"Counsel for defendants made two motions, one to defer the trial until the passion had died out and the other for a change of venue. These were denied. The Supreme Court of Florida, in affirming the conviction, observed that 'The inflamed public sentiment was against the crime with which the appellants were charged rather than defendants' race.' (40 So. 2d at 883). Such an estimate seems more charitable than realistic, and I cannot agree that the prejudice had subsided at the time of trial." *Ibid.*, at 53-54. See, e.g., Morgan, Hearsay Danger And The Application of The Hearsay Concept, 62 *Harv. L. Rev.* 177 (1948).

⁵⁷ 66 So. 2d 288, 291 (1953).

⁵⁸ "The general plan of such an operation . . . is to select the persons to whom the questions are to be propounded and, of course, from the ratio those interviewed bear to the whole population to determine the prevailing thought on the subject. Taken into consideration in planning the survey with which we are now dealing were the percentages of white adult persons, males and females, urban and rural residents." *Ibid.*

but it was vague as to the number of this category of persons in Gadsen and Jackson selected for questioning.

Under a field representative's immediate direction, interviewers proceeded to random points in urban areas and visited every other house in each block. "In country districts they evidently undertook to secure interviews equally as well."⁵⁹

Content of this questionnaire, briefly described by the Florida court, embraced, *inter alia*, ". . . inquiries about the specific case such as the guilt or innocence of the appellant [Irvin], the reluctance or timidity of jurors to vote for acquittal. . . ."⁶⁰

Striking similarity between that inquiry concerning a prospective juror's vote, and these lines from Justice Jackson's earlier concurring opinion should, at least be parenthetically noted,⁶¹ viz:

The only chance these Negroes had had of acquittal would have been in the courage and decency of some sturdy and forthright white person of sufficient standing to face and live down the odium among his white neighbors that such a vote, if required, would have brought.

Whether the defense tried, through these questionnaires, to ascertain if traces of those particular 1949 "prejudicial influences" still infected the community is not discussed by the court.

Turning to testimony offered by the defense through its second prospective witness, a field representative directly supervising interviewers, the Florida court noted that he heard "none of the answers given." Answers collected by these interviewers were subsequently tabulated in New York. Apparently several other witnesses were offered at this juncture in an abortive attempt to establish general interviewing techniques for surveys. This opinion points out that any information concerning contents of interviews, which might be adduced in testimony of the field representative⁶² would flow from a pyramid of hearsay and "vicarious knowledge." To this phase of its disapproval the court added its objection to the design of this ques-

⁵⁹ *Ibid.*, at 292.

⁶⁰ *Ibid.*

⁶¹ 341 U.S. 50, 55 (1951).

⁶² They were described in this opinion as being "patently ignorant of what transpired between questioner and questioned, what the attitude of the people of Marion County was toward the defendant and his impending trial." 66 So. 2d 288, 291 (1953).

"Neither the witness, the one who had general supervision nor the one who served as field representative, pretended even to have made any interviews on which he could base an opinion as to facts which would support an application for change of venue." *Ibid.*

tionnaire because it embodied introductory interrogatories on disassociated subjects, and reflected "no semblance of there having been a voluntary expression of the persons interviewed toward the defendant." Further deprecation followed from an explanation offered for including irrelevant inquiries in the questionnaire.⁶³ While such questions commended themselves to the Florida court as appropriate to polling popularity of household products they would not, it was said by this court, serve to ascertain and show the requisite "overpowering sentiment that would penetrate the thought of the community"⁶⁴ necessary to support a motion for change of venue.

Perhaps the pithy portion of this opinion was laid bare when this court summarized such testimony as not only inadmissible but:

. . . its competency was suspect. We need say no more in this regard than quote the supervisor who said, in reply to questions about the survey conducted by his organization prior to the presidential election in 1948, "in that kind of a survey we were very badly wrong". . . .⁶⁵

Judicial qualms about the *Irwin* survey should not influence jurists cited to that reported decision. For it must be remembered that the words "survey" and "poll" are terms of sweeping concept and multiple meanings. They do not identify any specific sampling design and refer to no specification of reliability. No legal or statistical authorities were cited by the Florida court when rejecting that "poll." Accordingly, *Irwin v. State* is authority for only what was there decided about the specific "poll of public opinion" reviewed, no more.

Rhodes Pharmacal Co., Inc. v. Federal Trade Commission^{65a} illustrates utilization by a drug manufacturer of a survey for gathering evidence of consumer reaction to advertisements challenged by the Federal Trade Commission. Confronted with an order of the Commission to cease and desist from disseminating allegedly false advertisements concerning therapeutic, curative and palliating properties of its product, Rhodes, petitioner on review, sought to establish

⁶³ Compare, Dr. Deming's authoritative analysis on the "failure of the questionnaire." *Some Theory of Sampling* 31 (1950).

⁶⁴ 66 So. 2d 288, 292 (1953).

⁶⁵ *Ibid.*

^{65a} 208 F. 2d 382 (C.A. 7th, 1954), application for cert. pending as of April 23, 1954. For a report on the earlier stages of this case see *F.T.C. v. Rhodes Pharmacal Co.*, 191 F. 2d 744 (C.A. 7th, 1951).

In its brief the government agreed "that the meaning of advertisements to the public might properly be determined by reliable surveys." See also *Quaker Oats Co. v. General Mills*, 134 F. 2d 429 (C.A. 7th, 1943) where both plaintiff and defendant conducted surveys in a controversy over trade-marks.

what these advertisements "meant" to persons reading them. On appeal from that order, petitioner relied on the following evidence to offset opinions of adverse witnesses and inferences drawn by the hearing examiner.

Some 300 persons were shown three of petitioner's advertisements, then asked these two questions:

Do these ads mean that [trade name of product involved] . . . will provide relief of pain of arthritis or rheumatism?

Do these ads mean that . . . [the product] . . . will provide treatment and cure for arthritis and rheumatism?

While conceding the theoretical soundness of interviewing potential customers in order to elicit meanings to them of these advertisements, the reviewing court soundly observed:

Obviously the value of a survey depends upon the manner in which it was conducted—whether the techniques used were slanted or fair. For instance, the Commission here contends that the form of, and the manner of asking the questions excluded the possibility of potential consumers answering that the advertisements made representations both as to treatment and cure, as well as to provide relief from pain.

From testimony given by the person conducting petitioner's survey, it appeared that 91% of the interviewees stated these advertisements "meant" that the product would provide relief from pain. Roughly 9% said they "meant" that petitioner's product would provide treatment for, and cure of arthritis and rheumatism.

Despite its own caveat, quoted above, the court declined to generalize or rule against the probative value of surveys. The court affirmed the cease and desist order, modifying it in part, but did not reach a full dress judicial evaluation of statistical techniques. Admittedly the evidentiary question concerning surveys as evidence on issues tried to a jury was not involved, this court noting that evidence excludable in ordinary jury trials may, sometimes, be received in administrative hearings.

Though some cases cited in this article originated with proceedings before administrative agencies they, together with the several judicial decisions, serve as tracings of the gradual emergence of a statistical approach for various problems arising in the legal field. These instances are the precursors to adoption and acceptance of statistical methodology as an aid in the search for truth. It is unsound to assume that several affidavits are representative of a mass of community opinions concerning bias or prejudice. A handful of

neighbors selected without regard to statistical methodology cannot accurately report the opinions of each individual member of their society. When public opinion is relevant to an issue only scientific sampling will supply evidence of it. One day the vacuous phrase "they say" will be replaced by a scientific report of fact.

If this article does no more than point up the absurdity of adjudicating issues grounded on public opinion by merely receiving evidence from several non-random members of a community, it will have served its purpose.

An appropriate summary of certain definitive characteristics typical of the particular methodology with which this article is concerned has been stated as follows:

A statistical survey, in modern practice, formulated and carried out by the dictates of the theory of probability, represents man's closest approach to empirical knowledge. It is an exciting and remarkable achievement, because the precision to be attained is controllable *in advance* within fairly narrow limits (depending on our state of knowledge with respect to certain empirical constants). More particularly, the precision actually reached, whatever it is, is measurable in an international standard with the aid of the information contained in the survey itself. This measure is objective, and is not a matter of opinion. Moreover, the instrumental and the constant human differences of measurement or of judgment can be separated out so as not to affect the estimated precision of the survey, whether it be a complete coverage or a sample.⁶⁶

Probability sampling should be made an available weapon in the intellectual armory of those fighting crime. Successful tactics are predicated on facts, not high abstractions, speculation and bare conjectures. Under the direction of competent and independent sampling specialists, data can be collected which will provide a variety of useful information in the areas of criminal law. For example, utilizing probability sampling, data can be collected from a mass of bound records or a collection of file cards. Once collected such information can be used as a check on statistics reported at a particular level or in a community. Here, then is a rapid, accurate and comparatively economical method which can be used to reproduce⁶⁷ the general characteristics of a general population⁶⁸ without separately examining all

⁶⁶ From a speech at the American Statistical Association meeting December 26, 1952, by Dr. W. Edwards Deming.

⁶⁷ "Statistical data are supposedly collected to provide a rational basis for action. The action may call for the enumerative interpretation of the data, or it may call for the analytic interpretation." W. Edwards Deming, *On The Distinction Between Enumerative And Analytic Surveys*, 48 J. Am. Statistical A. 244 (1953).

⁶⁸ In the statistical sense.

of its members or items. Probability sampling is widely used by the federal government, and in fact has been for some time.

Nor should that facet of statistical surveys concerning questionnaires be slighted. For as probability sampling was developing, the questionnaire technique for eliciting information from persons selected for interviews, was being improved. Lawyers are only too well aware of the question as a weapon in the search for truth, in and out of court. Accordingly, it is to be noted that the statisticians and closely allied scholars have gradually built up a reservoir of information about phrasing, framing and wording questions⁶⁹ which has not been tapped too frequently, outside of their field. That area, alone, deserves considerably more attention than can be permitted in this article.

Obviously a statistical survey is not sponsored here as the sole panacea. Nor is this article intended to do more than stimulate an interest in those modern methods which can, in qualified hands, serve in various areas of criminal law and procedure.⁷⁰

⁶⁹ S. L. Payne, *The Art of Asking Questions* (1951). While this book springs from experiences in polling on matters of opinion or information it presents an interesting contrast to Francis L. Wellman's, *The Art of Cross-Examination* (1904); Inbau and Reid, *Lie Detection and Criminal Interrogation, Part II*, at 142 ff (1953).

⁷⁰ Awareness of the usually justifiable criticism of those papers which embody wearisome and lengthy quotations precipitates this explanation. Such an indictment was risked here in order to present materials not readily available to the general busy reader of a law review, and because complexity and technicalities of the statistical aspects mentioned, required the skilled touch of the authorities' words.

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