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# DELINQUENCY AND BIOLOGY

SANDFORD J. FOX\*

*Oliver Wendell Holmes, Jr. said, "prevention would . . . seem to be the chief and only universal purpose of punishment." Professor Fox discusses the problem of biology as a causative factor in antisocial behavior. With the foundation of the criminal law based on punishment as a preventative measure, the entire structure of this area of the law must be viewed in a new light if biological factors have a causal role in the commission of crime.*

## I

There is little question but that practically every aspect of the problem of juvenile delinquency calls for constructive re-examination and rebuilding. The need for public education to the view that non-punitive treatment is not crime-promoting softness is paralleled by needs to reorient the thinking of professional groups directly concerned with delinquency. If lawyers have been overly slow to accept the idea that legal education and law practice do not suffice as training for the juvenile court bench, it is also accurate to observe that the departure of the child guidance clinics from the field of delinquency betokens a similar failure to modernize psychiatric thought.<sup>1</sup> The improvement of facilities, the

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1. At first these psychiatric centers furnished diagnostic and advisory services to the juvenile court. WITMER & TUFTS, *THE EFFECTIVENESS OF DELINQUENCY PREVENTION PROGRAMS* 34-36 (1954). When evidence revealed that this failed to prevent recidivism, S. & E.T. GLUECK, *ONE THOUSAND JUVENILE DELINQUENTS* (1934); Healy & Bronner, *The Close of Another Chapter in Criminology*, 19 *MENTAL HYGIENE* 208 (1935), direct treatment of delinquents and their families was undertaken; but only certain cases responded well and the intake policy of clinics was adjusted to eliminate the "noncurables." WITMER & TUFTS, *supra* at 38-40. "The result is that the delinquents whom child guidance clinics serve are not representative of the total delinquent population. They are more likely to be children of middle class than of lower class status and to be reacting to adverse parental attitudes alone rather than to such attitudes combined with adverse social conditions." *Id.* at 40.

Some insight into how highly selective the clinics can be is provided by the Chief Psychologist of the Philadelphia Child Guidance Clinic: "Briefly stated, the following conditions seem important in considering a case for out-patient psychotherapy:

1. A youngster of at least average intelligence who can more readily be diagnosed as a personality trait disturbance rather than either a personality pattern, psychopathic or sociopathic personality disturbance.
2. An adolescent who is able to recognize the overt parental disturbances within the first few sessions and can express anger appropriately about this situation.
3. An intact, economically adequate family in which the support for the anti-social behavior is primarily on an unconscious level.
4. A family in which interaction can most appropriately be described as 'hostile dependent.'
5. One or both parents, usually the mother, who are willing to participate at least during the early phases of their child's treatment in regular weekly interviews with the social worker. (We require that the father be seen, but contact with him may be infrequent.)
6. Community resources which among other things make it possible to propose realistically a placement plan should this become necessary."

recruitment of trained workers, the safeguarding of constitutional rights — these too are of great importance. This paper, while dealing directly with none of these problems, yet indirectly touches all, and then at a most fundamental level. The primary concern is with the causes of delinquency, the thesis a simple one: it is time that investigations into the causes of delinquency recognize fully the richness and relevance of biological knowledge.

This is, of course, not to assert that it is already established that colds or protruding brows cause delinquency; but merely that if progress in understanding the enigmatic subject of causes is to be achieved by systematic and comprehensive research rather than by speculation, researchers cannot exclude consideration of anatomical, biochemical and physiological factors.<sup>2</sup>

It is not difficult to understand why this whole field of knowledge is beset with imperfections. Until relatively recently it was exclusively the poets to whom we turned for insight concerning causation in human affairs. The enthusiasm for scientific research into the factors influencing personality and conduct that now occupy so many in the intellectual community cannot easily be traced further back than to Freud's development of psychoanalytic theory and the rise of empiric sociology. The result is that the present day has still to be counted as a viable, tentative and relatively immature era in the development of a science of human behavior, and nowhere is this more lucidly demonstrated than in the controversies centering on the etiology of crime and delinquency.

While some criminologists frankly acknowledge the defects in their understanding of the causation question,<sup>3</sup> others appear to sense that they have solved the puzzle.<sup>4</sup> Since the "proof of the pudding is in the eating" it is instructive to note a recent report on programs to prevent delinquency,

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Gordon, *A Psychotherapeutic Approach to Adolescents With Character Disorders*, 30 AM. J. ORTHOPSYCH. 757, 759-60 (1960).

2. There have been contentions back and forth on this issue of whether there is biological involvement in etiology. E.g., TAPPAN, *JUVENILE DELINQUENCY* 120-21 (1949) points out that hereditary influences cannot be ignored. BARNES & TEETERS, *NEW HORIZONS IN CRIMINOLOGY* 134 (3d ed. 1959) assert that group attitudes dominate any possible biological role. But, with exceptions noted *infra* pp. 78-82, there is sadly lacking any biologically-oriented factual research to implement the "pro" view and it is to this lacuna, not to the extant dialectics, that the point in the text is made.

3. E.g., "Both the treatment and the prevention of disease progresses haltingly until its pathology is established. In most instances, the great strides must wait upon the discovery of aetiology. As far as crime is concerned, whether it be normal criminality, which is essentially a social disease, or crime dependent on mental morbidity, its pathology is poorly understood and its aetiology is essentially unknown. We find ourselves in a position similar to that of the systematists of the eighteenth century; we must be satisfied largely with description and classification." Guttmacher, *The Psychiatric Approach to Crime and Correction*, 23 LAW & CONTEMP. PROB. 633, 636 (1958).

4. The impression one derives from reading some of the sociological comment is to the effect that the major hurdle has been surmounted by the decision that delinquent acts are traceable to social influences. E.g., "If we wish to have fewer

efforts that expressly or impliedly rely on conceptions of causation. The report introduces its conclusions with, "What does all this add up to, in knowledge about how to prevent or reduce delinquency? The answer, unfortunately, is 'With certainty, rather little.'"<sup>5</sup>

To this regrettable generalization there does exist a cluster of exceptions, however. These are the theories and findings of Sheldon and Eleanor Glueck that have achieved the farthest advances thus far known toward isolating causative factors. The precise significance of their accomplishments for present purposes is discussed below.<sup>6</sup> What is vital, however, is the point that there in fact exists a start, a methodology and a collection of data and interpretation concerning delinquency causation, that points the way toward greater knowledge. Certainly, if criminology is ever to achieve a more scientific status than it now enjoys, the practice in the so-called "pure" sciences of building on the ground already won, here represented by the Gluecks' reports, will have to be more demonstrably emulated than is now the case. Of course, if enhancing the status of criminology were the only goal involved, further research efforts of any sort could hardly be justified. But there are two other desiderata supporting the contention that a dimension of biological knowledge should supplement (not replace) what is already known of the causes of delinquency. One is that there exists persuasive evidence indicating that biological factors are in fact involved in the causal complex. The second is that the two extant alternative lines of investigation ("alternative" in the sense that biological considerations are ignored), those that draw primarily on either sociological principles or on psychiatric insights, appear to lead much too imperfectly to effective prevention and control of delinquency. Brief mention of what the deficiencies in these alternatives are understood to be is thus in order at this point, although a comprehensive critique is, of course, well beyond what can be undertaken. The evidence of biological involvement is discussed in Part IV, following the outline in Part III of the conceptual framework for the etiological role of biological factors. Finally, some of the legal implications of the thesis presented are examined in Part V.

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delinquents, or if we wish to modify the mode of life of those who already are delinquent, a way must be found to modify those aspects of the community life which provide the appropriate setting for delinquency careers and which give to these careers the sanctions and approbation on which all social behavior depends." SHAW & MCKAY, *JUVENILE DELINQUENCY AND URBAN AREAS* 446 (1942). See also GLASER, *The Sociological Approach to Crime and Correction*, 23 *LAW & CONTEMP. PROB.* 683 (1958); TANNENBAUM, *CRIME AND THE COMMUNITY* 51-83 (1938).

5. WITMER & TUFTS, *op. cit. supra* note 1, at 47.

6. Pp. 78-82, *infra*.

## II

Many American sociologists appear completely aware of the limits of present knowledge. A fairly typical prescription for expanding understanding is contained in the following evaluation:

Perhaps the unsatisfactory results of these treatment and prevention efforts have been due, in part at least, to the fact that our attention has been focused too much upon the individual delinquent and not enough upon the setting in which delinquency arises.<sup>7</sup>

This view that delinquency is primarily the result of social factors dominates most sociologically-oriented criminology. It seems clear enough, however, that there has been too much, not too little, emphasis placed on environmental considerations in etiological research and writing.<sup>8</sup>

Two considerations inhibit acceptance of more environmentalism of the neighborhood, gang, delinquency-subculture variety. The objection that only a small proportion of those exposed to such external antisocial influences show the effects of the supposed causes has never been satisfactorily explained or integrated into useful causal theory. That is, causation theories of this sort do not account for the fact that "the setting in which delinquency arises" is also the setting in which nondelinquency arises. Secondly, the enculturation view of delinquency causation fails adequately to focus on the processes by which individuals react to external stimuli so as to produce the antisocial behavior. It relates to too little of the make-up of the delinquent or potential delinquent, those whose individual motivation and functioning must be thoroughly understood if effective prevention and control is to be devised. By neglecting the contribution of individuality to the criminogenic brew in which environment is but one ingredient, the impression is promoted that the only way to diminish delinquency is to create something of a Utopia, with no slums, no gangs, no poolrooms, no unsavory adults who can be emulated, etc. This is an excellent idea, whether it affects delinquency or not. But that delinquency is an effect of this kind of social pathology remains more in the area of controversial theorizing than of demonstrated fact. Professor Glueck's writings, just cited,<sup>9</sup> deal more broadly with these and related objections and are highly persuasive on the point that enculturation generally, and "differ-

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7. SHAW & MCKAY, *supra* note 4.

8. See S. Glueck, *Crime Causation*, NATIONAL PROBATION ASSOCIATION YEAR-BOOK 86-108 (1941); S. Glueck, *Theory and Fact in Criminology*, 7 BRIT. J. DEL. 92 (1956); *cf.*, S. Glueck, *Ten Years of "Unraveling Juvenile Delinquency,"* 51 J. CRIM. L., C. & P. S. 283 (1960).

9. *Supra* note 8.

ential association" theory<sup>10</sup> in particular, have little to contribute either to understanding or to management of delinquency. Nevertheless, Sutherland's theory still dominates sociological thought,<sup>11</sup> with recent modifications falling short of correcting its basic faults. For example, manifestly little is gained in terms of bringing the individual more into the picture by adding to the variables that must be considered such amorphous factors as the "widespread social disorganization in the general adult society."<sup>12</sup>

Without significantly more consideration of the individual than these doctrines concede to be relevant, practically nothing can be done to direct therapeutic attention to children *before* they become serious law violators. Prevention programs that do not provide for effective action at such an early point approximate the vigilance of closing the barn door after the proverbial horse is out — a fair enough description of crime prevention efforts to date.

10. This is the leading environmental "explanation" of crime. See SUTHERLAND, *PRINCIPLES OF CRIMINOLOGY* 5-7 (3d ed. 1939). "Slightly paraphrased, Sutherland's last formulation of his theory is as follows: Criminal behavior is learned in interaction with others, principally in intimate personal groups. That which is learned includes techniques, attitudes, and rationalizations. Whether a person's motives and drives are criminal or noncriminal is a function of whether the legal codes have been defined by those around him in a manner favorable to their observance or to their violation. Most people encounter a mixture of these two types of influence. A person will become criminal if his associations result in an excess of definitions favorable to violation of law over definitions unfavorable to violations of law. The influence of such differential association is a function of its frequency, duration, priority, and intensity, in one direction or another. Both criminal and noncriminal behavior is acquired in such association by the same learning mechanisms, and both satisfy the same general human needs and values; but differential association determines the extent to which a person's experience promotes learning and motivation by criminal rather than noncriminal influences. . . . From the standpoint of Sutherland's theory, any correlate of crime must be shown to affect an individual's learning experience if it is to be thought of as having a causative function in his criminality." Glaser, *supra* note 4, at 688-89. Glaser takes Sutherland's critics to task for not recognizing the "integrating function" set forth in the last sentence of the above quote. *Id.* at 689. All this amounts to, however, is appending to the theory of learned criminality the proviso: *if, in fact, it is learned.*

11. Glaser, *supra* note 4, at 690. For a further statement of differential association see 8 *SOCIAL PROBLEMS* 2 (1960).

12. Clinard, *Secondary Community Influences and Juvenile Delinquency*, 261 *ANNALS* 42 (1949). Clinard also claims that, "In fact, the behavior of almost the entire adult world, whether in the neighborhood or not, constitutes a moral hazard to the juvenile." This comes perilously close to averring that everybody causes everything, a proposition from which delinquency prevention programs can benefit little. Emphasis on the influence of more groups than those to which the individual belongs (see Glaser's discussion of "reference groups" *supra* note 4, at 690-91) is subject to the same criticism of remoteness and impracticality.

*Cf.*, "Delinquency is conceived as a definite achievement, often the result of years of prolonged effort and hard work. It also holds that the same sociocultural processes that produce the criminal person produce the lawful person. This indicates why the sociological and social-psychological view is superior to others: it brings the widest range of behavioral, cultural, and social phenomena within the scope of a single theory. It is, therefore, unnecessary to invent specific pathologies to explain specific problems." Hartung, *A Critique of the Sociological Approach to Crime and Correction*, 23 *LAW & CONTEMP. PROB.* 703, 722 (1958). One is strongly inclined to add to the last sentence, after neutralizing the bias inherent in the use of the word "invent," "that is, unless there is a need to do something about a specific problem."

Turning from a sociological to a psychiatric orientation our expectation of focus on the individual is markedly satisfied. Because of this satisfaction and because nevertheless the insights of psychiatry largely fail to be *sufficiently* relevant and useful for delinquency prevention, it is necessary to take a brief look at the scope and limits of these insights.

In contrast to the enculturation alternative, psychiatry maintains that persons, events and relationships can be classed as causes of behavior if, and only if, they are mentally "ingested" by the individual so as to induce him to engage in the behavior. The psychiatric rubric for this, "It's not what happens to you that counts; it's what you think of what happens to you," is put succinctly by Doctor Bernard Glueck: "A factor is not a cause unless and until it first becomes a motive."<sup>13</sup> Thus the distinct value of this approach is that it takes into consideration *relevant* environment as well as facts of individuality.

The individual ingredient of this combination, the "innate tendencies" or drives or instincts are thought to be part of the biological equipment with which each person enters life. The environmental factors most potently affecting personality are those relating to the immediate family, primarily the parents or parent substitutes, while the period of most permanent impact is the first five or six years of life.<sup>14</sup>

As to the peculiar etiological combinations of drives and environment and the psychic structure from which delinquency derives, it has already been noted that as qualified a man as Doctor Guttmacher has answered flatly that such causes of delinquent behavior are not known.<sup>15</sup>

The basic writing taking a more affirmative position on this question, August Aichhorn's *Wayward Youth*,<sup>16</sup> found that delinquents were disturbed in the development of their ego, meaning that they were incapable of restraining and regulating pleasure-seeking impulses in a socially acceptable manner.<sup>17</sup>

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13. Quoted in S. Glueck, *Crime Causation*, *supra* note 8, at 99.

14. An excellent summary of the Freudian analysis of psychic development and activity is BRENNER, *AN ELEMENTARY TEXTBOOK OF PSYCHOANALYSIS* (1955). See also THOMPSON, *PSYCHOANALYSIS: EVOLUTION AND DEVELOPMENT* (1950). An equally useful discussion of the major changes of Freud's formulation by other psychiatrists is MUNROE, *SCHOOLS OF PSYCHOANALYTIC THOUGHT* (1955). The divergence of views is not significant for purposes of this paper.

15. *Supra* note 3. One is strongly led to the same conclusion by psychiatrists who maintain that it has been "shown beyond doubt that the differences in the psychological make-up of the delinquent and the non-delinquent are of a quantitative rather than of a qualitative kind." FRIEDLANDER, *THE PSYCHO-ANALYTICAL APPROACH TO JUVENILE DELINQUENCY* 6 (1947). Since there is no method of quantifying or of even discussing character development in quantitative terms this kind of statement amounts almost to a denial of any psychic difference at all between delinquent and non-delinquent. It appears that what is meant, however, is that the fundamental psychological processes of the delinquent do not differ from those of the non-delinquent, the significant differences relating rather to distortions or functional breakdowns of these universal processes. A summary description of this "delinquent psychology" is discussed immediately in the text.

16. First published in 1925. Citations are to the 1959 Meridian Books edition.

17. AICHHORN, *WAYWARD YOUTH* 153 (1959).

This concept of a deficient ego producing delinquency is still coin of the psychiatric realm, having been accepted and elaborated by more recent writers.<sup>18</sup> The reason why the ego fails to function properly, Aichhorn continues, is that there has been either a retardation of development so that the ego function of withholding impulse expression has remained at a primitive level, or, there has been a breakdown or regression in this function whereby the ego returns to an earlier level of operation, when instinctual activity did not significantly conflict with the demands of reality.<sup>19</sup>

There is general agreement that a defectively developed super-ego, or conscience, similarly plays a major role in permitting antisocial instinct activity by inadequately focusing internal controls of guilt or shame.<sup>20</sup>

One also finds extant the etiological theory, with supporting clinical data, that the delinquent child acts out the more or less unconscious instinctual impulses of a parent, thereby providing vicarious gratification for the mother or father while at the same time permitting the child to act consistently with the internalized image of the parent, an image that includes tendencies the latter may have toward prohibited acts.<sup>21</sup>

Conceptions such as these carry great prestige as the *real* facts of delinquency etiology since they deal so intimately with inability to control conduct and with augmenting one's own antisocial instincts with those of another. This is the "stuff" one would expect delinquency to be made of. Undoubtedly, they are of immense value in planning and carrying out treatment programs, although the diminution in availability of guidance clinic facilities for delinquents is some indication that etiological understanding is not sufficiently refined to move psychiatrists to the same degree of therapeutic enthusiasm for delinquents as they exhibit for other disorders that may be based on a more clearly conceived etiology.

But it is something else again to inquire after the adequacy of such psychiatric insights as have been mentioned to accomplish the task of prevention. To what extent are they capable of identifying delinquency-prone children "before the horse is stolen"? More precisely, do they facilitate separating, from among children six to ten years old, who are

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18. E.g., REDL & WINEMAN, *THE AGGRESSIVE CHILD* 141-45 (1957).

19. *Op. cit. supra* note 17, at 153. This idea of delinquency as the expression of a compromise between impulse and reality-demand that is *chronologically inappropriate* has also been adopted by more recent child psychiatrists.

"It cannot be sufficiently emphasized that all workers dealing with delinquents in any capacity ought to be aware of the fact that the anti-social urges they meet with in the delinquent are normal manifestations of the instinctive life of the small child, and that the preoccupation of delinquents with their desires and pleasures is equally manifest in the toddler." FRIEDLANDER, *op. cit. supra* note 15, at 27. Cf., Gardner, *The Community and the Aggressive Child*, 33 *MENTAL HYGIENE* 537 (1949).

20. AICHHORN, *WAYWARD YOUTH* 170-72 (1959).

21. Griffin, Johnson & Litin, *Specific Factors Determining Antisocial Acting Out*, 24 *AM. J. ORTHOPSYCH.* 668 (1954).



not manifesting any behavior problems those who may, nonetheless, be likely to engage in delinquency, or from among those who are having conduct difficulty, the relatively few who are starting serious and persistent delinquency rather than merely testing the controls of the environment?<sup>22</sup>

In regard to children not yet misbehaving the shortcomings of the psychiatric information are most obvious. There simply is nothing in the formulations that pertains to a differential diagnosis of the sort needed. That is, the need is to distinguish the more impaired and more regressed egos or super-egos from the more stable and healthy ones; and that is to be accomplished in the absence of gross behavioral symptoms. There are, of course, tools which enable a skilled person to estimate ego and super-ego strengths and weaknesses, *e.g.*, the Rorschach "ink blot" tests. But how "weak" must the response be to indicate a probability of delinquency? Psychiatric data are silent. To inquire into relevant psychic history for supplementary information, *e.g.*, infantile maternal relationships, poses the same question of interpreting the data; by how much must the mother have been overly strict or overly permissive?

When there has already been misbehavior, precisely the same difficulties are present. The psychiatric information serves well to explain generally, and with the benefit of hindsight, why misbehavior occurs. But the need to make distinctions is as pressing as before. Certainly one would have to dismiss much of common experience to believe that *all* instances of misbehavior in young children are reliable indicators of pre-delinquency. The high incidence of misconduct that soon tapers off and disappears prohibits entertaining such a belief. The same consideration — that most misconduct is irrelevant to the onset of serious delinquency — makes it impossible to demand public and private resources to support therapeutic intervention every time Johnny pulls Mary's pigtales.

The noted inadequacy of the psychiatric conceptions does not, of course, detract from the value of psychotherapy as a healing art. As a matter of fact, recognition that this is a healing art and not an exact science with a methodology of controlled experiment provides a clue to understanding why the inadequacy exists. The primary function of any healing is to improve the condition of its patients and its etiological principles must be designed for this end. This therapy-directed etiology is clearly seen in *Wayward Youth* where Aichhorn records the need for

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22. The facts appear to require focusing on children as young as those mentioned in the text. The Gluecks found that almost ninety per cent of their delinquents showed unmistakable signs of antisocial behavior before they reached the age of eleven; nearly sixty per cent were in court before attaining thirteen. S. & E.T. GLUECK, *UNRAVELING JUVENILE DELINQUENCY* 28, 293 (1950). Friedlander reports her experience to be that "in the majority of delinquents of anti-social character, the first signs of anti-social behavior appear between the ages of 7 and 9 years." *Op. cit. supra* note 15, at 11.

establishing the kind of relationship with his charges that his etiological conceptions indicate to be the most potentially fruitful for building impulse regulation.<sup>23</sup> There is no reason to expect this kind of etiology to perform the distinctly different task of identifying pre-delinquents. Considerations of differential diagnosis, measuring and weighing, then enter the picture that are almost wholly absent in the therapy situation. Data required to make the necessary discriminations are not forthcoming from clinical experience.

The *art* aspect is equally significant to the coarseness of psychiatric causal doctrine. The advantages available to other sciences that permit quantitative measurement and manipulation of variables are not part of the psychiatric methodology. In lieu of measurement one finds an intuition involving purposeful use of the psychiatrist's own personality. The extent to which he participates in the therapeutic situation as a feeling human being is probably unparalleled by the subjective activity of any other scientist. These factors help to explain why the expectation for precise and objective knowledge of individuality is less than completely satisfied by extant psychiatric learning.

Although it appears to be a basic postulate of psychiatry that each individual is different — that he has a "unique life situation,"<sup>24</sup> the exact elements of individuality remain shrouded in the vagueness of psychiatric symptom-description terminology. Thus in the presence of unhealthy parental relations we find some individuals become delinquent, some merely neurotic and some even psychotic. But what there is in the individual that helps to determine which of these symptoms will be chosen we do not know. To assert that the answer lies wholly in understanding the singularity of the infantile environment is tantamount to denying the role of individuality and is, in the present state of knowledge, an environmentalist prejudice only quantitatively different from that mentioned earlier in connection with sociologically-oriented theory. This

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23. "The individual who was always certain of love at home, or who could turn from one parent to the other, must be held in the institution through a certain inner compulsion dependent on the sympathy and goodwill of the counsellor, which will spur him on to achievements and to the overcoming of his difficulties. This inner compulsion is not immediately established. It will be developed through the transference situation. Normally, however, it arises from the fact that the educator offers the reward of recognition only for some achievement on the part of the pupil. . . . The child whose delinquency is the result of too great severity at home comes from a *milieu* which, both subjectively and objectively, has offered him nothing but opposition to his desires. We must take an attitude toward him entirely different from that toward the delinquents described above. Here we must strive for a reconciliation with him; we must make good the love of which he has been deprived. Everything which we have said about the happy atmosphere of the institution is especially applicable to this boy. He needs the friendly, cheerful counsellor. He belongs in an environment where the adolescent's need for pleasure is satisfied. This environment must be so constituted that it gradually leads the child to an adjustment to the real world in which pain as well as pleasure exists." AICHORN, *op. cit. supra* note 20, at 159-60.

24. Satten, in *Symposium on the Gluecks' Latest Research*, 15 FED. PROB. 52, 55 (No. 1, 1951).

relates nothing of the reasons why each personality differs from every other since no one has been able to describe with any precision the environmental conditions that produce one or another kind of personality symptom.

Directing attention to children recognized as pre-delinquents is, of course, not the only conceivable step in prevention and psychiatric knowledge has been applied to devising prevention programs on a wider scale. Friedlander, for example, finds the primary causes of delinquency to lie in early parental relationships while secondary causes are taken to be those found in environmental theories, *e.g.*, bad companions, unemployment, etc.<sup>25</sup> Prevention, therefore, takes the form of educating parents on how to avoid the wrong relationships, giving therapeutic assistance to those parents who themselves are too disordered to raise children properly, doing away with criminogenic cultural factors<sup>26</sup> and providing whatever treatment resources are necessary for those children who manage to avoid the impact of this program and get in trouble anyway.<sup>27</sup>

That a proposal for such far-reaching efforts lacks perception of how far society is from a state of such benevolent economic and social justice is only a minor point of criticism. More important is the unstated premise that changes in the environment of the parental and cultural sort will be sufficient to prevent delinquency. The influence of biological factors is thus wholly ignored and it is one burden of this paper to indicate that it is no less unwise to assert that biology counts for nothing than it is to insist that it counts for everything.

Two considerations, therefore, impel us to turn elsewhere. (1) Psychiatric knowledge does not permit the most direct and immediate prevention efforts, the identification of pre-delinquent children, and (2) there is no justification for assuming biology to be irrelevant. On the contrary, it may be highly relevant, as is pointed out in the remainder of this paper.

### III

Before dealing with some of the evidence of biological involvement in the causal complex it is necessary to make explicit the view of delinquency causation to which the evidence is relevant.

The basic assumption is that the more we know of how delinquents differ from non-delinquents the closer we are to knowing the causes of delinquency and to constructing effective means of prevention and control.<sup>28</sup> This is a form of recognition that no single factor is at work

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25. *Op. cit. supra* note 15, at 96-109.

26. "Good economic and housing conditions, a comprehensive health service and the abolition of unemployment will be among the most urgent necessities." *Id.* at 275.

27. *Id.* at 274-85.

28. *Cf.*, "It seems obvious that if we knew all of the detailed differences —

producing delinquency and that the influences are multifarious and inter-related.<sup>29</sup> That this assumption is a fruitful guide to etiological research has been effectively demonstrated by the Gluecks' success in comparing delinquents as a group with non-delinquents as a group.<sup>30</sup>

Seeking the causes of crime and delinquency in biology is, of course, a field already well known to criminology.<sup>31</sup> The objection made to assertions that biological factors cause crime is that there are large numbers of persons in the non-criminal population who exhibit the same deformities, diseases or disorders claimed to produce criminality. It has also been pointed out that standards of normality are absent to which a criminal biology may be compared.<sup>32</sup>

These objections are satisfactorily met by a causal theory that acknowledges the lack of inevitability of crime resulting from the presence of *any* single factor or combinations of factors — be they biological, psychological or sociological. Such a theory has already been well formulated:

Hence, there should be substituted for the notion of specificity or unity a causation (or of cause thinly disguised as "theory") the concept of internal and external pressures and inhibitions. If the total weight of pressures to anti-social behavior exceeds the total strength of inhibitory forces, the person commits crime. Theoretically, say, twenty factors of minor pressure (weight) are just as likely to conduce to criminal behaviour as four or five factors of heavy pressure. By substituting this concept of varied forces or energy reaching a point of anti-social discharge, for the insistence upon a certain specific theory or factor, or even syndrome, as inevitably and always conducting to delinquency, we arrive at a conception of *interchangeability* of etiologic traits and factors and thus at a realistic and relatively accurate doctrine of causation. At any time, the person is poised between a natural tendency to egoistic anti-social behaviour and a habit-disciplined tendency to conform to the socio-legal taboos. Biosocial pressures of one sort or another tend to turn the scales in one direction or another. (Of course, the relationship between energy pressure and inhibitory tendency is not usually simple or direct; there are,

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anatomical, physiological, and biochemical (including those at the cellular level) — between an individual who is a victim of muscular dystrophy and another individual of the same sex and age who is completely free both from the disease and from any tendency toward it, we would be at least well on the way toward an understanding of what the disease is." Williams, *Etiological Research in the Light of the Facts of Individuality*, 18 TEX. REP. ON BIOLOGY AND MEDICINE 168, 171 (1960).

29. For a list of "Factors Which Enfeeble Self-Control" and "Factors Which Enfeeble Social Control" see Beeley, *A Socio-psychological Theory of Crime and Delinquency: A Contribution to Etiology*, 45 J. CRIM. L., C. & P. S. 391, 395-96 (1954).

30. S. & E.T. GLUECK, *UNRAVELING JUVENILE DELINQUENCY* (1950). For an answer to criticisms leveled at this research see S. Glueck, *Ten Years of "Unraveling Juvenile Delinquency,"* 51 J. CRIM. L., C. & P. S. 283 (1960).

31. See Ploscowe, *Morphological and Physiological Factors in 1 REPORT ON THE CAUSES OF CRIME* 19-36 (1931).

32. *Id.* at 34-35.

as a rule, complex intermediary processes.) Consequently, it is not mesomorphic constitution, or strong instinctual impulse, or an hereditary aggressive tendency, or weak inhibitory mechanism, or low intelligence, or excessive emotional lability, or marked suggestibility, or an unresolved Oedipus situation, or residence in a poverty-stricken "delinquency area" or in a region with a tradition of delinquency, or "differential association" with those already criminal, or an excess of anti-social "definitions of the situation" or any other biological, social or cultural factor that *inevitably* conduces to delinquent behaviour. Any of these factors alone or in various combinations may or may not bring about delinquency, depending on the balance of energy tendencies at a particular time, in the particular individual involved. In times of great crisis, emergency, poverty, unemployment and the like, many persons will commit crimes who, under normal conditions, would not.<sup>33</sup>

A causal theory of interchangeable factors takes account of *all* influences on behavior. The utility of our basic assumption is thus evident, since comparison of delinquents with non-delinquents selects from among all possible influences the "traits, factors and areas *most relevant* to prediction, to therapeutic effort in the individual case and to prophylactic effort in general."<sup>34</sup> When we speak of the involvement of biological factors in the etiology of delinquency, therefore, we refer to those factors that serve to distinguish delinquents from non-delinquents and are, by virtue of that discriminating ability, among the *most relevant* causes, but not the *only* causes. We have the theoretical expectation that if biological factors are involved, they must occur in conjunction with relevant non-biological (environmental) factors in order to produce delinquency. It can be seen then that in the context of this theory the fact that any allegedly criminogenic biological factors appear in the non-delinquent group merely means that *none* of the combinations of relevant factors sufficient to produce antisocial behavior are then present; it does not mean that biology plays no role in regard to the delinquent group.

The comparison of delinquents with non-delinquents also relates to the objection that standards of normality are lacking. The norm becomes pragmatically defined in terms of a significantly different incidence or absence in the control group. In this sense the characteristics of the non-delinquents in the Gluecks' *Unraveling Juvenile Delinquency* study may be taken as norms. This approach is clearly necessary since biological norms cannot be defined beforehand from medical or other scientific literature since it appears that variations within the so-called "normal" group are too great to be ignored through adopting a mean or median

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33. S. Glueck, *Theory and Fact in Criminology*, 7 BRIT. J. DEL. 92, 105 (1956).

34. *Id.* at 106.

or other kind of statistical compromise.<sup>35</sup> The significance of these variations to the likelihood of biological involvement is discussed below.<sup>36</sup> Their present significance is that comprehensive investigation of biological causes is highly complex and poses novel problems.

It has been statistically estimated that:

in a population of one hundred thousand well individuals there are not more than a very few thousand at most whose anatomy, physiology, and biochemistry are "normal," if by normal we mean that their values for one hundred measurable items (an extremely modest number) are *all* within the median 95 per cent of the very same population. . . . If the number of measurable items is much larger than one hundred, the number of "normals" approaches the vanishing point.<sup>37</sup>

In view of this, the research that is ultimately needed may not be a simple comparison of white blood cell counts or thyroid secretions. Rather there seems to be a pattern comparison called for, one that takes into account individual disconformities and the interdependence of all parts of the human being. The study of *disconformity patterns* (the term belongs to Dr. Williams<sup>38</sup>) is a novel one that would likely require cooperation with data processing experts as well as biologists and biochemists. But criminology has always been largely dependent on other disciplines and this increased dimension of complexity should present no insurmountable difficulties.

The conceptual framework is, therefore, one of interchangeable causes derived from controlled investigation of delinquent and non-delinquent

35. "A commonly accepted point of view in the field of biology and related disciplines — physiology, biochemistry, psychology — and in the applied fields of medicine, psychiatry, and social relations appears to be that humanity can be divided into two groups: (1) the vast majority possess attributes which are within the normal range; (2) a small minority possess attributes far enough out of line so that they should be considered deviates. . . .

The most commonly accepted line of demarcation between normal and abnormal in biological work is the 95 per cent level. That is, all values lying outside those possessed by 95 per cent of the population may be regarded as deviant values, and any individual who possesses such deviant values may be regarded as a deviate.

If we consider the possibility that among the numerous measurable attributes that human beings possess there may be many which are not mathematically correlated, we are confronted with an idea which is opposed to the basic dichotomy of normal and abnormal mentioned above. If 0.95 of the population is normal with respect to one measurable item, only 0.902 (0.95<sup>2</sup>) would be normal with respect to two measurable items and 0.60 (0.95<sup>10</sup>) and 0.0059 (0.95<sup>100</sup>), respectively, would be normal with regard to 10 and 100 uncorrelated items.

The existence in every human being of a vast array of attributes which are potentially measurable (whether by present methods or not), and probably often uncorrelated mathematically, makes quite tenable the hypothesis that *practically every human being is a deviate in some respects.*" WILLIAMS, *BIOCHEMICAL INDIVIDUALITY* 2-3 (1956).

36. Pp. 83-85.

37. Williams, *supra* note 28, at 170.

38. *Id.* at 171.

groups. In addition, there is reason to believe that the factors that are the subject of the investigation are combinations or patterns rather than individual items.

#### IV

We now proceed to a discussion of evidence of biological causes of delinquency. Three sources indicating that there are such causes are examined. The first is data drawn from the Gluecks' *Physique and Delinquency*; second are the facts of biological individuality, and third is the significance of certain bodily disorders that frequently produce criminogenic symptoms.

##### A. THE GLUECK DATA

###### 1. *The Role of Body-Type in Delinquency Causation*

Part of the research in *Unraveling Juvenile Delinquency* included comparison of delinquents and non-delinquents to unearth possible differences in the appearance of the various somatotypes in the two groups.<sup>39</sup> It was found that significant differences do exist on this score and an extensive analysis of the differentiating data was undertaken.

Since the research subjects were paired by ethnico-racial background<sup>40</sup> it is highly significant to note that (1) the proportion of mesomorphs among the delinquents was nearly twice that of the non-delinquents (60.1% : 30.7%),<sup>41</sup> and (2) the delinquent group contained only about

39. The method of classifying an individual depended upon "the respective degree of participation of each of the major constitutional components—endomorphy, mesomorphy, and ectomorphy. The following definitions of these presumably fundamental building-blocks of body structure are from Sheldon's *The Varieties of Human Physique*:

*Endomorphy* means relative predominance of soft roundness throughout the various regions of the body. When endomorphy is dominant the digestive viscera are massive and tend relatively to dominate the bodily economy. The digestive viscera are derived principally from the *endodermal* embryonic layer.

*Mesomorphy* means relative predominance of muscle, bone, and connective tissue. The mesomorphic physique is normally heavy, hard, and rectangular in outline. Bone and muscle are prominent and the skin is made thick by a heavy underlying connective tissue. The entire bodily economy is dominated, relatively, by tissues from the *mesodermal* embryonic layer.

*Ectomorphy* means relative predominance of linearity and fragility. In proportion to his mass, the ectomorph has the greatest surface area and hence relatively the greatest sensory exposure to the outside world. Relative to his mass he also has the largest brain and central nervous system. In a sense, therefore, his bodily economy is relatively dominated by tissues derived from the *ectodermal* embryonic layer." S. & E. T. GLUECK, *PHYSIQUE AND DELINQUENCY* 7-8 (1956). For purposes of analysis, the dominant component determined the classification of each subject. That is, a boy with much muscle and bone (mesomorphy), relatively little soft roundness (endomorphy) and practically no linearity or fragility (ectomorphy) is classified simply by "physique type" as a *mesomorph*, rather than the more encompassing term *endomorphic mesomorph*, indicating his "somatotype." *Id.* at 8-10.

40. See S. & E.T. GLUECK, *UNRAVELING JUVENILE DELINQUENCY* 37-38 (1950) for details of the matching.

41. S. & E.T. GLUECK, *PHYSIQUE AND DELINQUENCY* 9 (1956).

one-third as many ectomorphs as did the non-delinquents (14.4% : 39.6%).<sup>42</sup>

The evidentiary value of this data to the issue of biological factor involvement occurs via the factors underlying or accompanying the development of body types. That is, regardless of the hereditary or environmental basis of body type, it is generally accepted that body type is strongly influenced by such factors as endocrine functions. It seems reasonable to expect, therefore, that there is a positive relationship between certain somatotypes and certain biological patterns, such as the various combinations of output levels of the endocrine glands.

Since it has been found that the presence of a mesomorphic constitution is, by virtue of its capacity to distinguish delinquents from non-delinquents, a clue to potential delinquency, it may be hypothesized that this is, in turn, due to other biological considerations (endocrine patterns, for example) concurrently present but operating more directly, to make the mesomorphic individual particularly vulnerable to criminogenic influences. In other words, in the interplay of internal and external forces, pressing for either inhibition or acting out of antisocial impulses, the existence of biological pattern X (that which may be associated with mesomorphy) may produce a particular susceptibility to the acting out pressures. This is *not* to say that there is anything *invariable* about either the relationships of somatotype to delinquency or of somatotype-related physiological processes to delinquency. No one to one relationship can be expected to exist. The crux of the hypothesis presented is that these biological factors create a *potential* for delinquency, which, when in combination with other factors conducive to antisocial behavior, produces delinquency.

If this were so then such associated patterns would also show up as part of the causal complex.

The *delinquency potential* of mesomorphs suggested above was investigated by the Gluecks, not in terms of the biological foundations and accompaniments of mesomorphy, but rather to discover the traits significantly associated with the non-delinquent mesomorphs of their study. The non-delinquents were used in order to avoid having the fact of delinquency color the inquiry into what traits are particularly mesomorphic. The fact that they found traits that might be expected in delinquency lends additional support for the hypothesis that a criminogenic link exists between the biological concomitants of mesomorphy and delinquency. They found it:

reasonable to infer that mesomorphs are in fact more vigorous than the other body types. This conclusion is based on the fact that, as compared with other physiques, mesomorphs are as a

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42. *Ibid.*



group found to have been less susceptible to contagion in childhood . . . have more strength in their hands . . . are less sensitive, less aesthetic, and less sensuous; they have less of a tendency to phantasy, suffer less from feelings of inadequacy, and are less destructive and destructive-sadistic. Further, they are more practical, more socially assertive, markedly less submissive to authority. . . . less unstable emotionally, less burdened by emotional conflicts, and less inhibited in motor responses to stimuli (i.e., more likely to express their tensions in action rather than to bottle them up).<sup>43</sup>

These are the kinds of characteristics that "unless channeled toward socially acceptable goals, . . . might well furnish the strength, daring, and enterprise, together with the dynamic tendency to unrestrained action that are involved in much delinquency . . . ."<sup>44</sup>

The finding that delinquency is *underassociated* with ectomorphy supports the hypothesis of biological involvement from another aspect. It is assumed that ectomorphy reflects peculiar and more "basic" biological patterns to the same extent as does mesomorphy. The inference that delinquents have a relative lack of "ectomorphic patterns," (based on the Gluecks' finding and the above assumption) leads to the supposition that these patterns, in some way, support control of antisocial conduct and that personality traits expected to be associated with non-delinquency (the links between biological pattern and behavior) would be found to characterize the ectomorphs in *Unraveling Juvenile Delinquency*. This latter supposition is in fact realized. Ectomorphs, although more destructive and sadistic, and less emotionally stable, are more prone to emotional conflict, more inhibited in action, more inclined to phantasy, sensitivity and aestheticism than the more delinquency-prone mesomorphs, and, on the whole, of the other body types as well.<sup>45</sup> In short, the "stuff" of which delinquency is made, the daring, strength and lack of inhibition in motor responses, is noticeably lacking. We hypothesize that the biological concomitants of ectomorphy therefore may be present as indicators of relatively low delinquency potential.

In summary, the hypothesis that significant biological differences exist between delinquents and non-delinquents is supported by the evidence that the two groups are distinguishable by body types. The supposition

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43. *Id.* at 218-19.

44. *Id.* at 219. "It must further be kept in mind that although recognizing the greater delinquency potential of mesomorphs, the admixture of the *uniformly* criminogenic (common ground) traits with those affecting the physique types variously, may result in more widespread delinquency among mesomorphs than in other body types. For example, a trait such as adventurousness, when it occurs in boys of the strong, energetic, and uncontrolled mesomorphic physique, may well have more of a bearing on their behavior than when occurring in the less dynamic endomorph; emotional conflict may well have a different destiny in the dynamic mesomorph than in the sensitive but inhibited ectomorph." *Id.* at 226-27.

45. *Id.* at 236-37.

that body types are, in turn, associated with other biological phenomena has been noted in connection with findings that traits and characteristics to be expected in delinquency are in fact connected with certain body types and not with others, leading to the inference that body type-related-biology is similarly connected.

## 2. *The Biological Base of Certain Criminogenic Character Traits*

A portion of the more than four hundred comparisons made in *Unraveling Juvenile Delinquency* was based on psychiatric interviews and administration of the Rorschach Test. The resulting psychological items on which the delinquents differed most significantly from the non-delinquents provide a treasure of factual knowledge of delinquent psychology, or, as it is denominated here, criminogenic character traits.

Since the research possessed biological knowledge of each boy (his physique type) as well as this psychic data, the Gluecks were able to investigate the relationships between the criminogenic traits and the known biological endowment and to report the results in *Physique and Delinquency*. One of the most important and far-reaching aspects of this volume is the conclusion that the relationships in the research data make it reasonable to infer that there is a biological basis to some of these psychic characteristics. The relationship signifying this is a significant variation in incidence of criminogenic character traits among the physique types of the non-delinquent control group. The absence of this variation, of course, does not rule out biological orientation of a trait since there still exists the possibility that it has biological determinants that are not related to physique type as well as that it is culturally conditioned.<sup>46</sup>

The following are the traits that differentiated the two groups and as to which the inference may reasonably be drawn that their derivation is traceable to biological factors related to physique type: tendency to phantasy,<sup>47</sup> marked submissiveness,<sup>48</sup> vivacity,<sup>49</sup> social assertiveness,<sup>50</sup> masochistic trends,<sup>51</sup> uninhibited motor response to stimuli,<sup>52</sup> aestheticism,<sup>53</sup> acquisitiveness,<sup>54</sup> conventionality,<sup>55</sup> practicality,<sup>56</sup> lack of fear of failure and defeat,<sup>57</sup> destructiveness,<sup>58</sup> lack of marked dependence on others,<sup>59</sup> destruc-

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46. *Id.* at 12-14.

47. *Id.* at 72.

48. *Id.* at 81.

49. *Id.* at 117.

50. *Id.* at 78.

51. *Id.* at 111.

52. *Id.* at 130.

53. *Id.* at 133.

54. *Id.* at 136.

55. *Id.* at 138.

56. *Id.* at 141.

57. *Id.* at 93.

58. *Id.* at 101.

59. *Id.* at 105.

tive-sadistic trends,<sup>60</sup> emotional instability,<sup>61</sup> susceptibility to contagion,<sup>62</sup> strength of hand grip,<sup>63</sup> inadequacy,<sup>64</sup> sensuousness,<sup>65</sup> and emotional conflicts.<sup>66</sup>

The fact that there exists such a constellation of factors (significant for the early identification of delinquency-prone children by virtue of their capacity for differentiation) that is possibly linked to biological make-up presents a sharp challenge to investigate the configuration of such a make-up.

### 3. *The Biological Explanation for the Differential Impact of a Criminogenic Environment*

The rather lengthy title of this subsection merely refers to the possibility that the reason why certain antisocial environmental influences impel only *some* to antisocial conduct may be the different biological endowments among those in the environment. That individual vulnerability to adverse life circumstances may be based, in part, upon variations in biological equipment is indicated by another portion of the *Physique and Delinquency* report. The evidence giving rise to this inference is variation of environmental factors among the physique types of the delinquents. That is, the findings reveal that there is a significant difference in the extent to which unfavorable environment produces delinquency among the several body types. For example, 81.4% of the ectomorphic delinquents had incompatible parents as compared to only 60.4% of the mesomorphic delinquents. The probability of such a difference occurring by chance is only two out of one hundred.<sup>67</sup> This data suggests that incompatibility of parents is a more potent delinquency-producing factor among children with one kind of biological make-up than it is with those of another.

Other environmental factors whose statistical variation leads to similar suggestions are emotional disturbance in father,<sup>68</sup> gainful employment of mother,<sup>69</sup> careless household routine,<sup>70</sup> lack of cultural refinement in home,<sup>71</sup> broken home,<sup>72</sup> rearing by parent substitute,<sup>73</sup> low conduct stand-

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60. *Id.* at 112.

61. *Id.* at 132.

62. *Id.* at 48.

63. *Id.* at 59.

64. *Id.* at 127.

65. *Id.* at 135.

66. *Id.* at 143.

67. *Id.* at 189.

68. *Id.* at 167.

69. *Id.* at 174.

70. *Id.* at 178.

71. *Id.* at 179.

72. *Id.* at 180.

73. *Id.* at 181.

ards of family,<sup>74</sup> lack of family group recreations,<sup>75</sup> meager recreational facilities in home,<sup>76</sup> lack of family unity,<sup>77</sup> lack of attachment of mother to boy,<sup>78</sup> lack of attachment of siblings to boy,<sup>79</sup> careless supervision by mother,<sup>80</sup> and unsuitable discipline by father.<sup>81</sup>

#### B. THE BIOLOGICAL BASIS OF PERSONALITY

Reference has already been made to the need for pragmatically revising conceptions of normality in the investigation of delinquency causation.<sup>82</sup> A closely related line of thought provides additional support for inferring the involvement of biological individuality to the development of personality. An articulate advocate of the potential fruitfulness of such a study has contended that it is probable that in the development of personality characteristics "one's distinctive endocrine system and one's distinctive brain morphology are more important factors than the toilet training one receives as an infant."<sup>83</sup>

The evidence marshalled of biological individuality makes it reasonable to infer that investigation of biological factors will yield a greater understanding of "first, of what is personality composed; e.g., if two people have differing personalities in what specific ways do they or may they differ? Secondly, how do distinctive personalities arise? Thirdly, how can improvement or modification of personality be brought about?"<sup>84</sup> It is certainly no less reasonable to infer that such investigation can also yield a greater understanding of delinquency, of aggressive antisocial personality expression. Indeed, Dr. Williams suggests that "the 'personality problem' to be initially investigated [be] one for which the biological roots *might be* successfully guessed in advance. Such might include . . . hypo-sexuality, homosexuality, . . . alcoholism . . . etc."<sup>85</sup>

The details of the evidence relied on for the thesis of the biological roots of personality are striking to anyone in the habit of assuming that all more or less healthy individuals are put together with approximately similar proportions of bodily material. Such assumptions appear to be properly a part of popular mythology.

For example, one study of the size and shape of heart development in childhood concluded that there were so many variations that no one

74. *Id.* at 186.

75. *Id.* at 190.

76. *Id.* at 192.

77. *Id.* at 193.

78. *Id.* at 197.

79. *Ibid.*

80. *Id.* at 201.

81. *Id.* at 203.

82. Pp. 76-77 *supra*.

83. Williams, *The Biological Approach to the Study of Personality* 14, paper presented to the Berkeley Conference on Personality Development in Childhood, University of California, May 5, 1960.

84. *Id.* at 1.

85. *Id.* at 17.

shape could be thought of as "normal."<sup>86</sup> Hearts without any known defect are reported to vary in their pumping capacity by as much as from 3.16 to 10.81 liters of blood per minute.<sup>87</sup> There are at least twelve known forms of the right cavity of the heart into which the blood flows.<sup>88</sup> The number, diameter and shape of the arteries leaving the heart is also known to vary as much as three-fold.<sup>89</sup> Considering the primal position of the heart and related circulatory anatomy in maintaining all bodily functions it can readily be grasped how the variations mentioned might lead to practically endless differences among individuals if combined with a complex of variations in other significant biological areas.

Such a complex of variations can be found in the endocrine system. Variety exists in the weight of the organs: the thyroid range is from 8 to 50 grams,<sup>90</sup> the parathyroid from 50 to 300 milligrams,<sup>91</sup> the pancreas from 65 to 160 grams,<sup>92</sup> the pituitary glands from 350 to 1100 milligrams.<sup>93</sup> Healthy individuals exhibit wide variation in endocrine function as well. Insulin production probably varies ten-fold,<sup>94</sup> pituitary hormones span a similar range;<sup>95</sup> androgens produced by the testis vary eleven-fold.<sup>96</sup>

The composition of normal human blood is also subject to astounding variation. Total cholesterol in plasma can be found to be from 109 to 428 milligrams per cent.<sup>97</sup> Sodium in corpuscles can be from 8.7 to 28.6 milliequivalents per thousand milliliters.<sup>98</sup> Potassium in whole blood varies from 39 to 62 milliequivalents per thousand milliliters.<sup>99</sup> Studies indicate the range of amino acids in plasma to approximate four-fold.<sup>100</sup>

These are but a handful of items taken from a collection that seems literally to establish that it is most unlikely, almost impossible, for any two individuals to be biologically alike. The data makes it out of the question to proceed in any area of human research on the assumption that variety in individuals is wholly attributable to variety in their environments. Environments do not come in such individualized packages. We have noted before that even emotional environment, although assumed by psychiatry to be unique for each individual, has never been broken down into its individualistic components. Compared to the coarseness

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86. WILLIAMS, *BIOCHEMICAL INDIVIDUALITY* 28 (1956):

87. *Ibid.*

88. *Ibid.*

89. *Id.* at 30.

90. *Id.* at 81.

91. *Id.* at 84.

92. *Id.* at 85.

93. *Id.* at 92.

94. *Id.* at 85.

95. *Id.* at 92.

96. *Id.* at 88.

97. *Id.* at 52.

98. *Id.* at 50.

99. *Ibid.*

100. *Id.* at 55.

with which we must describe individual environment, biology offers a tool of relative precision. Biology appears to be a source of the missing true individualism and only an unscientific preconception would reject it and ignore completely the role of biological variety; the human is too much of a unitary being for biological uniqueness to have no effect on the development and dynamics of his psychological and behavioral being and there is no reason to exempt criminal behavior and criminal psychodynamics.

### C. DIRECT CRIMINAL EFFECTS OF BIOLOGICAL FACTORS

The third, and last, reason presented for believing there to be biological causes of delinquency involves certain bodily disorders that have been reported to have led directly to criminal acts. Three considerations must be emphasized at the outset. One is that there has apparently never been a comprehensive and systematic attempt to survey the medical literature in order to unearth and analyze all of the ailments known to have produced symptoms of antisocial behavior; hypoglycemia, discussed below, is merely a more notorious disorder of this class. How limited or widespread such a class would be no one knows. Secondly, there appears to be no reliable indication of the relative incidence of such potentially criminogenic maladies as hypoglycemia in delinquent and non-delinquent populations. This, however, is a question to be answered by empiric research designed to uncover the role of body pathology in the complex pattern of etiology. The fact that "society exhibits a large number of persons of varying degrees of physical disability who are entirely free from criminal or delinquent conduct"<sup>101</sup> is indicative of lack of causal influence only in the purview of a naive causal theory that seeks invariable and uniform relationships of a one to one type. Once perceiving, however, that the problem is to determine the most frequently operative causal *patterns*, composed of many interacting factors, body pathology of the sort mentioned here remains as evidence that biological factors involved in such pathology may combine with other influences to produce delinquent behavior by a combined impact.

For the third preliminary matter, one which provides a theoretical framework for expecting such an impact, we resort to another suggestion of *Biochemical Individuality*.<sup>102</sup> This is Dr. Williams' formulation of the *principle of genetic gradients*: "Whenever an extreme genetic character appears in an individual organism, it should be taken as an indication (unless there is proof to the contrary) that less extreme and graduated genetic characters of the same sort exist in other individual organisms."<sup>103</sup>

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101. Guibord, *Physical States of Criminal Women*, 8 J. CRIM. L., C. & P. S. 82, 85 (1917).

102. WILLIAMS, *op. cit. supra* note 86.

103. *Id.* at 13.

In view of this and to the extent that there is a genetic basis to them, the facts of biological individuality amply support the idea that where a range of variation is discovered it is reasonable to assume that there is a distribution of individuals within that range. Thus, if as indicated below, for example, it is known that extremes in blood sugar depletion have led persons to acts of violence in what may be called "neutral or non-inducing circumstances," the principle of genetic gradients and our theory that many factors usually combine to produce delinquency leads to the hypothesis that there are those with lesser depletion values whose threshold of action may be precipitated by less "neutral" and more criminogenic psychic or cultural factors. In other words, low blood sugar and its concomitant biology may be involved in the causal complex even if the sugar is not at the point of pathological hypoglycemia.

Turning to hypoglycemia for illustrative purposes we find numerous medical reports of criminal conduct during hypoglycemic episodes by people described as "well mannered" or "devoted." One mother stuck a pin into the eye of her infant son and then nearly strangled him.<sup>104</sup> Another case is a boy who, in hypoglycemia, destroyed expensive property.<sup>105</sup> Undressing in public is recorded,<sup>106</sup> as is disorderly conduct and traffic law violation.<sup>107</sup> The list should also include theft<sup>108</sup> and violent homicide.<sup>109</sup>

There is, of course, difficulty in tracing these behavioral symptoms to the door of depressed blood sugar, in cases where the depressed level is induced artificially by insulin intake, as well as where it is generated spontaneously by internal factors, such as tumor of the pancreas,<sup>110</sup> liver pathology, or inadequate functioning of the pituitary gland, the thyroid gland or the adrenal cortices.<sup>111</sup> But it appears that skillful diagnosis can accomplish the task with reasonable accuracy.<sup>112</sup>

An understanding of the psychological and physiological effects of hypoglycemia provides insight into the mechanisms by which a lowered blood sugar level can be translated into antisocial conduct. The psychic states are described by one physician as including impairment of will power, hazy thinking, irritability and strengthening of aggressive and

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104. Adlersberg & Dolger, *Medico-Legal Problems of Hypoglycemic Reactions in Diabetes*, 12 ANNALS OF INT. MED. 1804, 1807 (1939).

105. *Ibid.*

106. *Ibid.*

107. *Id.* at 1809.

108. Podolsky, *The Chemical Brew of Criminal Behavior*, 45 J. CRIM. L., C. & P. S. 675 (1955).

109. Hill & Sargent, *A Case of Matricide*, 1943 THE LANCET 526.

110. See Scholz, ReMine & Priestly, *Hyperinsulinism: Review of 95 Cases of Functioning Pancreatic Islet Cell Tumors*, 35 PROCEEDINGS OF THE MAYO CLINIC 545 (1960).

111. R. WILDER, *CLINICAL DIABETES MELLITUS AND HYPERINSULINISM* 347 (1941).

112. See J. Wilder, *Sugar Metabolism in its Relation to Criminology*, in *HANDBOOK OF CORRECTIONAL PSYCHOLOGY* 108-09 (Linder & Seliger, eds. 1947); Adlersberg & Dolger, *supra* note 104, at 1812; Hill & Sargent, *supra* note 109, at 526.

sexual drives.<sup>113</sup> Others report the following for mild hypoglycemia:

irritability, anxiety, depression, exhilaration or excitability . . . .  
 Partial disorientation and confusion, tendency to dabble or loiter and slowness of thought and action are commonly observed.  
 Lack of will power and inability to make simple decisions may lead to *folie de doute* or *Entschlusslosigkeit*.<sup>114</sup>

More severe cases produce an exaggeration of these symptoms with more extreme forms of concomitant behavior.<sup>115</sup>

The fact that hypoglycemia may be artificially induced by insulin injections has led to self-experiments by physicians that confirm the reports based on patient observation.<sup>116</sup>

The changes that occur in the brain of a hypoglycemic individual have been studied by many investigators. A review of twenty-five articles describing these changes found evidence to support the theory that a major change is a decrease in the supply of oxygen available to the brain.<sup>117</sup> An eminent authority adds that not all brain functions are equally affected, the impact being largely on the mechanisms of inhibition.<sup>118</sup> This would explain the reports of behavior that appears to be a manifestation of uninhibited aggressive or sexual impulse.

The final item to be noted in this highly capsulized view of hypoglycemia and crime relates to the incidence of this ailment. We can speak only of approximations, but turning to recognized researchers minimizes the possible error of an estimate. Jonathan Wilder says spontaneous hypoglycemia seems to be no less frequent than diabetes.<sup>119</sup> In a massive survey of the town of Oxford, Massachusetts, diabetes was found in 1.7% of the population. Relating this to the population of the United States in 1960 gives a figure of about three million.<sup>120</sup> If we consider that most diabetics take insulin and are, therefore, potentially

113. Podolsky, *supra* note 108, at 677.

114. Adlersberg & Dolger, *supra* note 104, at 1805.

115. *Id.* at 1806-07.

116. "One person reports about her feeling the lack of initiative and an inability to make decisions with the words: 'I don't want to move or talk. To take a pencil from the table requires as much will power as climbing a mountain.' Another person, in awaking from a moderate hypoglycemic state, says: 'Now I begin to see clearer. I had a feeling as though I had passed into the beyond. What a strange situation. You are partly here, partly far away. Everything was seen and heard as though it were behind a veil. I experienced unbelievable indifference against everything.' Another statement is: 'I feel absolute indifference. I register all I hear without adopting any special viewpoint. There are neither agreeable nor disagreeable memories.'" J. Wilder, *supra* note 112, at 107. By any comprehensive theory of etiology such reactions of indifference in a person unaware of his hypoglycemia while functioning in an environment conducive to criminal acting out would seem to be a major cause of his criminal conduct.

117. See JOSLIN, ROOT, WHITE & MARBLE, *TREATMENT OF DIABETES MELLITUS* 325 (10th ed. 1959).

118. J. Wilder, *supra* note 112, at 105.

119. *Id.* at 104.

120. JOSLIN, ROOT, WHITE & MARBLE, *op. cit. supra* note 117, at 12.



subject to hypoglycemic episodes the total incidence approaches six million on a nation-wide scale. Thus it would not be amiss to say that "a few million" persons may experience hypoglycemia. It is also significant to note that "children, as a rule, not only show a more marked tendency to low blood sugar but seem to get symptoms quicker."<sup>121</sup>

A summary of the evidentiary value of the characteristics of hypoglycemia would point out that this is an example of biological factors operating fairly directly to produce criminal behavior. The various observations on the level of conduct, psychology and physiology all tend to bear out the extreme likelihood of antisocial behavior. The *principle of genetic gradients* permits us to hypothesize that similar criminogenic biology can be found, only with much more subtle impact. Our eclectic point of view, in turn, permits the explanation that the reportedly heavy incidence of hypoglycemia does not lead to a tidal wave of crime, because it is biology interacting with psychology and environment that produces crime, not biology alone.

## V

Since we have been thus far concerned with the statement of a hypothesis and an assessment of the fact and theory that point to it being a reasonable hypothesis, much that has been said has necessarily been of a speculative nature, dependent on the drawing of many inferences. Any attempt to discuss what all this means for the criminal law and its administration must also partake of this same tentativeness. One cannot propose or evaluate specific changes in law or practice unless and until the results of rigorous scientific investigations confirm the hypothesis that there are biological causes at work. Pending this, however, we can foresee, in broad terms, some of the legal challenges that might arise.

The most obvious legal issue to which criminogenic biology relates is that of responsibility. For example, would a crime proved to have been committed during a hypoglycemic episode be encompassed by any of the extant rules of criminal insanity? The most difficult hurdle would be establishing that there was a *mental* disease, since this is a requisite for the *McNaghten* test,<sup>122</sup> the *Durham* rule,<sup>123</sup> and the Model Penal Code formulations;<sup>124</sup> the defense of "irresistible impulse" is also dependent

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121. J. Wilder, *supra* note 112, at 104.

122. 10 Cl. & Fin. 200, 8 Eng. Rep. 718 (H.L. 1843).

123. *Durham v. United States*, 214 F.2d 862 (D.C. Cir. 1954).

124. MODEL PENAL CODE § 4.01 (Tent. Draft No. 4, 1955).

upon mental impairment.<sup>125</sup> As has been pointed out, hypoglycemia does produce mental symptoms. Holding that these symptoms are sufficiently related to the organic defect to be denominated as mental disease or defect for the purposes of the application of an insanity test would be one means of overcoming this initial difficulty. That there is leeway so to hold has been indicated by the conclusion of one commentator that "the existence or non-existence of mental illness is not solely a factual question to be determined by objective observation or examination. It is also a question calling for a policy or philosophical judgment concerning what kinds of abnormality should be included in the term 'mental illness.'"<sup>126</sup>

While there are additional problems of whether, even if there is mental disease, the remainder of the test is satisfied, *e.g.*, did the defendant know right from wrong, did he lack capacity to appreciate the criminality of his conduct, etc., the more fundamental issue has been highlighted by Professor Weihofen's focusing on policy. Do the same reasons of policy that make for the existence of the defense of insanity *per se* also apply to cases where biological pathology is involved in the commission of the act? Here the analysis must await the fruits of investigation since at issue are such questions as whether those with the pathology can be considered non-deterrables and whether it would be considered unjust to impose the stigma of criminality on such persons. Until more is known of the nature of the biological factors and the circumstances in which they help to produce criminality answers cannot be estimated.<sup>127</sup>

Apart from questions of responsibility, the finding of biological causes would present basic problems of criminal law policy at the sentencing phase. Suppose, for example, it had been established that the offender to be sentenced had bodily state X, that his criminal act would not have taken place but for X and that accepted medical treatment, which he agrees to undergo, would relieve him of X. Do considerations of general deterrence require doing more to the offender than seeing to it that he lives up to his agreement? Certainly the more widespread the finding of biological causes the less justification there is for shaping the policies of the law to make examples of offenders, unless there is also some

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125. *E.g.*, "In order to constitute a crime, a person must have intelligence and capacity enough to have a criminal intent and purpose; and if his reason and mental powers are either so deficient that he has no will, no conscience or controlling mental power, or if through the overwhelming violence of mental disease, his intellectual power is for the time obliterated, he is not a responsible agent, and is not punishable for criminal acts." *Commonwealth v. Rogers*, 48 Mass. (7 Metc.) 500 (1844).

126. Weihofen, *The Definition of Mental Illness*, 21 OHIO ST. L.J. 1, 5 (1960).

127. It has been urged that the hypoglycemia accompanying certain phases of the menstrual cycle can and should excuse female crimes committed at that time on grounds of insanity. See Oleck, *Legal Aspects of Pre-menstrual Tension*, 166 INT. REC. MED. 492 (1953). Hypoglycemia is also reported to be common during lactation. J. Wilder, *supra* note 112, at 113. This condition has been recognized as a ground for diminished responsibility in the English Infanticide Act, 1938, 1 & 2 Geo. 6, c. 36 and in the FRENCH PENAL CODE, art. 302.

indication that the influence of the biological factors is, in turn, responsive to the motivation created by these examples. This too is a problem to be solved by investigation and can only be recognized as possibly in the offing, as is the question of whether any constitutional impediment may exist to requiring a recalcitrant offender to "take the pill."

As to the main body of criminal law, it may be noted that the definition and grading of substantive offenses by means of the presence or absence of a particular state of mind may be subject to serious question if it turns out that the state of mind is frequently a product of organic factors. Thus a homicide committed during a dazed hypoglycemic interlude may result in no criminal liability at all if the acts can be characterized as merely negligent. But suppose the hypoglycemia is more severe and the individual is thereby put in such a state of sensitivity and hostility that what would normally be a trivial annoyance produces maniacal violence; in the absence of the intervention of some irresponsibility rule, murder liability would likely result. But clearly the common background of two such cases should make for narrowing greatly the divergence of the results. How best to achieve this, either by way of recognizing mitigating circumstances or by lessening the substantive significance of state of mind, or by still some other means may be a major challenge to legal ingenuity.

The final legal implication to be mentioned relates to the development of a more sound basis for the exercise of the broad discretion that characterizes almost all aspects of criminal law in action. Although there is little disagreement that "substantive criminal law has been an island of technicality in a sea of discretion" there has been too little attention paid to providing prosecutors, judges and correctional administrators with the background necessary to make their discretionary decisions wise as well as technically correct. It seems clear that if an offense is committed under the influence of a disorder such as hypoglycemia, this factor ought to be taken into account in the decision of whether to prosecute, in the sentencing decision and in the formulation of a post-conviction treatment program. But if none of the responsible officials or defense counsel is aware of the role of such biological considerations their decisions cannot be fully informed decisions and the exercise of discretion must, perforce, be only fortuitously wise and haphazardly just. The last point, therefore, is that means of both formal and informal education may have to be devised to disseminate findings of biological causation.

#### CONCLUSIONS

Investigation of biological factors has several hurdles to overcome before it can become a reality. The academic disciplines that have assumed primary responsibility for dealing with the basic problems of delinquency have exhibited less than striking enthusiasm for this field. Psychiatry, in particular, stands to benefit greatly, however, from the knowledge of

individuality it now lacks and which seems to be promised by biological research. Whether psychiatry would become more of a biological science or biology would become a behavioral science is significant only to the inertia of professional traditions, a consideration that ought not to bar interdisciplinary cooperation.

Experience has shown that a "*wise eclecticism*, guiding research in which investigations, examinations and tests are thorough, . . . is still the only promising and sensible credo for the modern criminologist."<sup>128</sup> There is reason to believe that in spite of the methodological novelty and complexity of the research suggested herein, the same wise eclecticism can fruitfully encompass the field of human biology.

If this field does yield up insights into the causes of crime and delinquency many matters of criminal law rules, policy and education may be in need of thorough re-examination.

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128. Glueck, *Theory and Fact in Criminology*, 7 BRIT. J. DEL. 92, 108 (1956).