social circumstances that permit the emergence of changed perspectives. Thus the conventional model of permissive child-rearing is also presented as a sort of mistaken idea, arising out of the desires of well-intentioned professionals to correct the abuses of an earlier generation of excessively repressive experts. But people familiar with the history of the professions know full well that experts, especially child-care experts, have always cloaked their pronouncements in the mantle of an overriding concern for those they are supposed to serve. In the case of the United States, throughout the end of the 19th and the first part of the 20th century, psychologists, social workers, and the like were instrumental in the assault on family patterns and child-rearing practices of immigrant families, which had to be transformed to fit the requisites of the American economic and social structure. Throughout the middle third of this century the assault has continued, with the target shifting to nonwhite families. At the same time shifts in professional opinion regarding "normal" families have usually been associated with changes in social conditions, and typically those shifts have proven to be, as William Kessen has noted, "in large measure, instrumentalities of other powers in American life" ("Insights on the Child Development Movement in the United States," *Monogr. Soc. Res. Child Dev.* 40, Nos. 3-4, 1975, p. 101).

The authors speak of desiring "a responsible and caring society, requiring a high degree of human involvement" and tolerant of a "multiplicity of models for living" (p. 365), but they have ignored the possibility that it is the structure and dynamic of this particular society that make sustained human involvements marked by tolerance, mutual responsibility, and caring difficult to obtain. In such conditions it makes no sense to speak of "society" as an abstract and undifferentiated whole, nor is it reasonable to speak of forging "new alliances . . . between the family and society" (p. 365). I fear that in the long run analyses such as these, however well intentioned, may work against the people they are designed to aid. It is a dilemma that must be faced by all social scientists who attempt to address social problems.

HOWARD GADLIN
Department of Psychology, University of Massachusetts, Amherst 01002

Factors Associated with Criminality

Biosocial Bases of Criminal Behavior. SARNOFF A. MEDNICK and KARL O. CHRISTIANSEN, Eds. Gardner Press, New York, 1977 (distributor, Wiley, New York). xx, 298 pp. $22.95.

The term "criminal" quite possibly conceals more heterogeneity than any other description of human behavior. Criminals are 20-year-old four-time losers and 70-year-old first offenders; lower-class Jean Valjeans and upper-class thrill kidnappers; chronic schizophrenics and persons only morally "insane"; child-molesters and other criminals who despise child-molesters. Some criminals turn themselves in and others never get caught (or convicted); some act on principle or out of desperation, others on impulse or whim; and, though we would prefer not to think so, there are even some who commit crimes because they like it.

A major stumbling block in the scientific study of criminality has been our inability to process this heterogeneity and delineate subtypes that could possibly be associated with specific causes. There are signs, however, that we are beginning to make progress. Epidemiologists are just beginning to generate the prevalence estimates that are essential for testing certain genetic or environmental hypotheses. Studies of the distribution of crime among the population are also revealing. Gösta Carlsson's chapter in this volume is a good brief introduction to behavioral epidemiology. Carlsson points out that the viability of certain theories of criminal behavior depends substantially on whether or not most crime is produced by a few people. A high concentration of criminal activity among a few people would support "kinds of people" or "growing commitment to crime" hypotheses and would argue against explanations emphasizing temporary situations that affect substantial numbers of people. Carlsson finds crime in Sweden to be quite concentrated and goes on to the identification of one type of person that is definitely at a higher risk for crime: psychopaths.

Other investigators also find crime to be highly concentrated. In the first chapter of this book Mednick reports that 1 percent of males accounted for more than half the offenses committed by a Copenhagen birth cohort of over 30,000 men. He cites Wolfgang as reporting a similar result for a Philadelphia sample. Mednick's hypothesis is that this small group of active recidivists are fundamentally different from the rest of us, and from many other criminals as well, in that they have a physiological defect that prevents them from learning to inhibit aggressive responses. Rather than focus on the learning of deviant behavior Mednick constructs a model for the learning of law-abiding behavior, which consists of the following sequence: The child anticipates making an aggressive response but because of previous punishment develops a classically conditioned fear response; this fear motivates him or her to inhibit the aggressive response; and the inhibition is reinforced by reduction of fear. According to Mednick, the autonomic nervous systems of the high-risk recidivists are deficient in their ability to dissipate fear, which results in a very slow or small reinforcement for inhibiting aggressive responses. Mednick uses slow recovery of electrodermal responses as an index of the hypothesized autonomic liability and predicts that a combination of hyporesponsiveness and slow electrodermal recovery yields the maximum autonomic predisposition to criminal behavior.

Six of the 19 chapters in this book are devoted to research and reviews of research on psychophysiological factors in asocial behavior. Mednick and his colleagues report their findings on electrodermal responsiveness and recovery of responses among (i) criminal or noncriminal sons reared by criminal or noncriminal fathers, (ii) groups of antisocial adolescents, and (iii) children who later become delinquent or are diagnosed as psychopaths. The work of other investigators is integrated with these results, and Mednick concludes that numerous empirical tests have not disconfirmed his hypothesis.

David Siddle reviews the work on electrodermal activity in psychopaths and agrees with Mednick that the data on electrodermal responsivity are relatively consistent. He argues, however, that differences in skin conductance responses between psychopaths and normals could indicate the presence of attentional rather than autonomic deficits in psychopaths. Whether the deficit is attentional or autonomic, the thrust of all this work is that psychopaths are physiologically different from the rest of us. Although

Mednick's model for the learning of law-abiding behavior emphasizes the role of persumably innate autonomic nervous system differences, it clearly allows for the possibility that a substantial number of active criminal recidivists could be produced through environmental circumstances. Inconsistent discipline or reinforcement of aggressive responses could produce phenocopies of autonomic nervous system deficits. There is some evidence, however, that genetic factors are important in the etiology of psychopathy and criminal behavior. Six chapters are devoted to the presentation and evaluation of this evidence.

Karl Christiansen reviews the eight studies that have been made of criminality among identical and fraternal twins and reports that seven of them provide results compatible with a genetic hypothesis. Identical twins are more frequently concordant for criminality than are fraternal twins. However, since the environments of identical twins may be more alike in certain relevant aspects than the environments of fraternal twins it is desirable to look at concordance for criminality among separated identical twins. From the literature on separated twins Christiansen finds eight pairs who displayed criminal behavior. Four of these pairs were concordant. This figure is only slightly below the concordance for identical twins reared together. Nevertheless, Christiansen is cautious in drawing inferences from these twin studies and concludes only that the a priori hypothesis of genetic and environmental involvement in criminal behavior can still be maintained.

Christiansen also presents, in a separate chapter, the results of a preliminary study of criminality among 3586 unselected twin pairs from the Danish Twin Registry. Criminal registration was found in at least one member of 799 pairs. Pairwise concordance rates were 25 percent for identical male twins and 15 percent for fraternal male twins. Both these concordance rates are lower than those found in most earlier twin studies, and Christiansen attributes this to the unrepresentativeness of earlier samples. Christiansen uses all these twin data in a creative exploration of the factors that influence the manifestation of criminal behavior in twins. He constructs a ratio of the proband concordance rate to the rate of crime in a specific twin group. This twin coefficient measures how "communicable" crime is to co-twins given that one member of the twin pair is a registered criminal. The twin coefficient is higher for female twin pairs than it is for male twin pairs, which is the reverse of what is found with traditional concordance rates. Since registered criminality involves greater deviancy from group norms for females than for males, Christiansen interprets the twin coefficient almost as an index of the degree of association of criminal behavior with other forms of deviance (such as mental illness). Twin coefficients were higher for older, rural-born, and higher-social-class twins than they were for younger, urban-born, and lower-class twins respectively. Similar indices could be of considerable use in other branches of social science.

The adoption study of criminality reported by Hutchings and Mednick is most interesting. The complexities of behavior-genetic research on human characteristics are amply illustrated in this chapter. Adopted males were classified as criminal or noncriminal according to their presence or absence in the official Danish criminal records. The biological and adoptive fathers of these two groups of adoptees were also classified as criminal or noncriminal, and the association between fathers' and sons' criminality was determined separately for both biological and adoptive fathers. A matched sample of nonadopted controls was investigated in the same manner. Of the noncriminal, nonadopted controls, 9.5 percent had fathers who were registered for criminality, and of the criminal nonadopted controls 21.0 percent had fathers who were similarily registered. These offspring share both genes and environment with their fathers, and some combination of these influences produces the association between the criminality of fathers and that of sons. If genetic factors are primarily responsible for the association there should not be much of a relation between criminality in adopted children and criminality in their adoptive parents. However, the strength of the relationship in the adoptive families is identical to that found among nonadoptive families. Of the noncriminal adopted males, 9.2 percent had criminal adoptive fathers, and of the criminal adoptees 21.7 percent had criminal adoptive fathers. This would seem to exclude genetic factors as significant etiological variables in criminality. Nevertheless, when the only basis for similarity between fathers and sons is genetic, as it is for biological fathers and their adopted-away sons, an equally strong relationship between fathers' and sons' criminality is found. Can shared environment alone or shared genes alone be sufficient to reproduce the familial clustering found in nonadoptive homes?

Selective placement could be the reason for these perplexing results. The authors note that there was a low but statistically significant correlation between the social classes of the biological and adoptive fathers. In a separate chapter, the authors also report that adoption agencies paid particular attention to mental disorder and registered criminality in the biological parents before a child was cleared for adoption. This raises the possibility that the separation of genetic and environmental influences in adoption studies could have been precluded by adoption agencies' placing the children of criminal biological parents with adoptive parents who had already been registered for criminality. This would be possible only if the biological fathers' criminal behavior started before the children were born and if the adoption agencies would place children in families with criminal records. In the course of evaluating a different hypothesis the authors present some evidence that weighs against a significant amount of selective placement based on direct assessments of parents' criminality. The adopted-away sons of biological fathers whose first conviction followed the birth of the sons had the same criminality rates as the total sample of sons of criminal biological fathers. This still leaves the possibility that selective placement on the basis of social class could account for the results. To evaluate the impact of such selective placement the authors present the results of two multiple-regression analyses where the criminality and social class of the adoptive and biological fathers are entered as independent predictors of criminality in the adopted offspring. The major conclusion was that the biological father's criminality remains a significant predictor even when the criminality and social class of the adoptive father have been controlled.

A suggestion as to how both genetic and environmental variables are producing their effect comes from the results of a cross-fostering analysis. Adoptees having noncriminal biological fathers but reared by criminal fathers have the same rate of criminality as adoptees without criminality in either biological or adoptive father (this base-rate group had 10.5 percent criminality). Absent a predisposition the environment has no effect. Adoptees having criminal biological fathers but reared by noncriminal adoptive fathers have twice the rate of criminality as the base-rate group. The predisposition shows itself even in a benign environment. The highest rate of criminality was found among the adoptees having criminal biological fathers and reared with criminal adoptive fathers.

This rate was over three times the base rate. A criminal environment enhances the predisposition.

Fini Schulsinger's previously published adoption study of psychopathy is reprinted in this volume. Starting with a group of adopted psychopaths and a group of adopted controls Schulsinger found psychopathy five times as prevalent among the biological parents of the psychopaths as among their adoptive parents. There was little or no psychopathy among the biological and adoptive parents of the controls. All the researchers writing in this volume are cautious in drawing inferences about the relative influence of environment and heredity in criminality. Given the great heterogeneity in crime and criminals they seem wise to accept that environmental factors play a major role in many types of crime. Mednick interprets the evidence to indicate that variations in the environment best account for crime among the lower class whereas genetic factors are linked to crime among the middle and upper classes.

The epidemiological facts provided by the many large-scale Scandinavian studies also provide an interesting new perspective on crime. By comparison with the situation in the United States, poverty and other adverse environmental circumstances have been drastically curtailed in Scandinavia, yet about 9 percent of males receive felony convictions during their lifetimes. Does this fact represent a limit to what socialism can accomplish in crime reduction? Perhaps not, but it might encourage a search for environmental variables qualitatively different in character from social class, health, and employment.

Another fact emerging from a number of the investigations reported here is the association between criminal behavior and schizophrenia. Kirkegaard-Sørensen and Mednick report that rates of criminality are significantly elevated among the offspring of schizophrenic mothers. Similar results are obtained in adoption studies where the schizophrenic mothers had nothing to do with rearing their children. Perhaps the contribution of the schizophrenic mother was genetic.

Overall, this book leaves the reader with the impression that evidence from various sources is slowly converging on the idea that individual differences among criminals are real and that even eradication of environmental inequities will not make them all go away. Some criminals, perhaps the very worst, are very different from the rest of us. These differences seem most pronounced in that small group of active recidivists that commits up to half of all crimes. We cannot afford to neglect the possibility that biological factors are significantly linked to crime in this group.

JOSEPH M. HORN
Department of Psychology,
University of Texas,
Austin 78712

A Study in Human Capacities

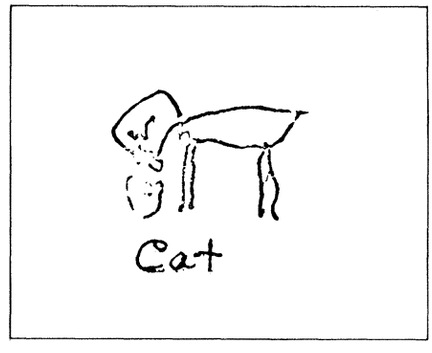
Genie. A Psycholinguistic Study of a Modern-Day "Wild Child." SUSAN CURTISS. Academic Press, New York, 1977. xvi, 288 pp. $27.50. Perspectives in Neurolinguistics and Psycholinguistics.

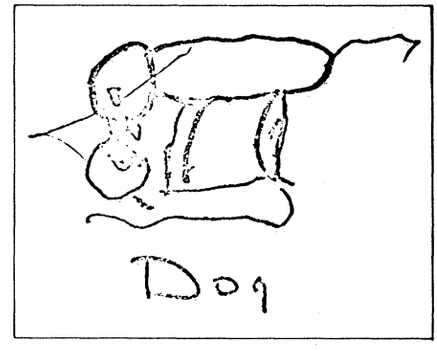
In his book *Biological Foundations of Language* (Wiley, 1967) E. H. Lenneberg hypothesized that language learning in humans is constrained to a particular developmental period; if a human is to acquire language, he or she must do so roughly between the age of two and puberty. According to Lenneberg, behavioral evidence for the lower bound of this critical period comes from normal language acquisition, which does not universally begin until about age two. Evidence for the upper bound comes primarily from pathology. Damage to the left side of the brain (the hemisphere dominant for language in most people) before the age of 13 usually will not result in permanent language impairment; damage after that age tends to produce irreversible language losses. Moreover, language acquisition in retardates proceeds at a slow but steady pace until age 13, at which time linguistic progress, regardless of level attained, halts.

The crucial test of the critical-period hypothesis is, of course, whether an individual prevented from learning language during the first 13 years of life can develop language thereafter. For obvious reasons the experimental manipulation that would answer this question has not been carried out. However, tragic circumstances have created Genie, the subject of this book and a test case for the critical-period hypothesis.

Genie was discovered at the age of 13 years, 7 months, after having experienced a childhood of extreme and unusual deprivation and abuse. From the age of 20 months, she had been confined to a small room and allowed no freedom of movement, no perceptual stimulation, and no human companionship. Under these inhumane conditions, it is hardly surprising that Genie did not develop language.

Since the time of her discovery in 1970, attempts have been made to rehabilitate and educate Genie. This book is a description of Genie's first five years after discovery, focusing on her linguistic progress. Four chapters describing Genie's language abilities make up the bulk of the book. One deals with Genie's phonology, both comprehension and production. Two others focus, respectively, on her comprehension and on her production of syntax, morphology, and semantics. The fourth of this group of chapters compares Genie's linguistic ca-





"Genie's drawing of a human figure (12/22/71). Note the lack of either trunk (if lines represent arms) or arms (if lines represent trunk), and legs, ears, hair, clothes, and so forth. Contrast this primitive figure with the detail she produced when asked, at an earlier time (11/8/71), to draw 'a cat eating,' 'a dog eating.' The animals have a well defined trunk and head, four legs, and other features. The tongue, one eye, and tail are in keeping with a profile view, a fairly sophisticated perspective." [From *Genie: A Psycholinguistic Study of a Modern-Day "Wild Child"*]