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NOTES AND COMMENTS

The XYY Syndrome and the Judicial System

INTRODUCTION

The concept of the "born criminal" is not new. There has long been a popular belief in the existence of persons predestined to a life of crime. In modern times such ideas have been scorned by the scientific and legal communities as the product of ignorance and superstition.

In the late 1960's, however, the emergence of the "XYY syndrome" brought renewed speculation about the existence of persons genetically predisposed to anti-social behavior. Two violent murderers were found to be suffering from a chromosome abnormality which appeared to be associated with criminal tendencies. Both were "XYY" males, sensationally portrayed by the media as "super-males" because their genetic makeup included an extra male sex chromosome. Persons possessing this genotype were said to be marked by subnormal intelligence, extreme height, and aggressive, anti-social behavior. The fact that they were seemingly found almost exclusively in prisons and institutions for the mentally disturbed appeared to confirm the status of the XYY male as a "born criminal."

Now that the publicity which accompanied discovery of the XYY anomaly has subsided, it is clear that many of the early assumptions about the condition have proven to be untrue or half true. XYY males are not "born criminals." Many have average intelligence, and are capable of living normal lives. Yet, studies continue to reveal the number of XYYs in penal settings to be considerably higher than the incidence in the general population. And by now, there appears to be a quiet recognition by behavioral scientists of the XYY male's reduced capacity to conform his behavior to accepted standards. This comment will examine the XYY syndrome, and its relationship to the judicial system.

THE NATURE OF THE XYY SYNDROME

The term "XYY Syndrome" refers to the presence of an extra Y sex chromosome in the genetic makeup of some males. Since the Y chromosome is closely related to certain male traits, especially aggressiveness, the XYY male has been described as having "a double dose of those potencies that . . . facilitate the development of aggressive be-

havior."¹ The most striking physical characteristic of the XYY male is extreme height, generally above the 90 percentile. The frequency of the syndrome in the general population is close to 1 in 1,000 (0.1%),² a figure which contrasts sharply with the incidence (about 2.0%) among persons detained in prisons and institutions for mentally disturbed persons.

To explain the nature of the XYY Syndrome, a brief discussion of elementary genetics is necessary. The normal human cell contains forty-six chromosomes, arranged in twenty-three pairs.³ It is through the chromosomes that the traits of the parent cell are transmitted during cell division. Forty-four of the chromosomes are called autosomes, and are identical in size and shape. The two remaining chromosomes are the sex chromosomes with which this discussion is concerned.

There are two types of sex chromosomes; the X configuration, which is identified with female characteristics, and the Y, associated with masculine traits. In a normal woman (XX), the twenty-third chromosome pair consists of two X chromosomes. The normal male (XY), has one X and one Y chromosome.

In rare instances, there is a deviation from the normal pattern, and the cells contain forty-seven chromosomes, with the extra one a sex chromosome. The most common such aberration is known as Klinefelters Syndrome.⁴ Here, there are two X chromosomes and one Y. The resultant XXY constitution produces a sterile male, with subnormal intelligence, and certain female characteristics such as developed breasts. In far more rare instances, the extra sex chromosome is a Y, and the XYY male results.

BEHAVIOR STUDIES OF THE XYY SYNDROME

In 1965, reports first appeared linking the XYY Syndrome with behavioral abnormalities. One of the most important of these concerned a study by Patricia Jacobs of mentally subnormal patients having violent, or criminal propensities.⁵ The subjects were institutionalized at Carstairs, a special security hospital in Scotland. One hundred

1. Montagu, *Chromosomes and Crime*, 2 PSYCHOLOGY TODAY 42 (1968) [hereinafter cited as Mantagu].

2. Hook, *Behavioral Implications of the Human XYY Genotype*, 179 SCIENCE 139 (1973) [hereinafter cited as Hook].

3. See generally Montagu, *supra* note 1, at 46-48; H. SUTTON, AN INTRODUCTION TO HUMAN GENETICS; W. SINGLETON, ELEMENTARY GENETICS, ch. 1.

4. Montagu, *supra* note 1, at 47.

5. Jacobs, Brunton, Melville, Brittain & McClemon, *Aggressive Behavior, Mental Subnormality, and the XYY Male*, 208 NATURE 1351 (1965) [hereinafter cited as Jacobs].

ninety-seven persons were tested, and of these, seven (or 3.6%)⁶ were XYY's, one had an XXY chromosome constitution, and another displayed an XY/XYY mosaic pattern. The significance of these findings can be seen by comparing the 3.6% incidence at Carstairs, with the results of subsequent tests of the general population. The Jacobs group uncovered five XYY's among 3500 consecutive male infants (0.14%), and no XYY's among 2040 "normal" adults studied.⁷ The relatively high incidence of the XYY Syndrome within the institutionalized populations strongly suggested a correlation between the syndrome, and violent criminal behavior.

Another significant discovery by the Jacobs group was the unusual height of the XYY males.⁸ The XYY males discovered had a mean height of 73.1 inches as opposed to an average of 67.0 inches for males at Carstairs having normal chromosome makeup. Almost 50% of the institutionalized males over 72 inches tall were XYY individuals.

Another early test was conducted at Rampton, a hospital similar to Carstairs.⁹ There, Casey also discovered a relatively high frequency of XYY males among patients exhibiting persistent violent or aggressive behavior. Again, XYY's were considerably taller than a randomly chosen control group. Casey concluded that there appeared to be a correlation between the presence of an extra Y chromosome, and such manifestations as anti-social behavior and abnormal height in the mentally subnormal males studied.

The Casey research team then extended its study to cover five different classes of subjects.¹⁰ They discovered a relatively high incidence of XYY males in groups consisting of: I) mentally sub-normal persons detained because of anti-social behavior, II) mentally ill persons incarcerated due to anti-social behavior, III) prisoners serving sentences for anti-social acts. Negative results (no XYY's) were uncovered in the following groups: IV) institutionalized mentally ill persons not specially detained because of anti-social behavior, and V) a sampling of persons from the normal population.

The results among group I generally supported his initial findings. The group II (mentally ill) and the group III (general criminal popu-

6. A later study, using a more complete sampling of the same population, showed a 2.85% incidence of XYY individuals. The findings were otherwise similar.

7. Ratcliffe, Stewart, Melville, Jacobs, Keay, *Chromosome Studies on 3500 New-born Male Infants*, I LANCET 121 (1970).

8. Jacobs, *supra* note 5, at 1352.

9. See generally Casey, Blank, Street, Segall, McDougal, McGrath & Skinner, *YY Chromosomes and Antisocial Behavior*, II LANCET 859 (1966).

10. *Id.* Because of the previously noted tendency of persons having the XYY chromosome constitution to be unusually tall, the Casey group selected as subjects in each group only persons over 72" in height.

lation) results were significant in that they indicated that the XYY genotype may be a factor in anti-social behavior by persons whose intelligence is not subnormal.

The earliest studies of the XYY Syndrome were conducted in institutions housing mentally ill or mentally subnormal persons, because it was generally believed that genetic abnormalities were causally related to these conditions. The discovery by Casey of XYY males having normal, or near normal intelligence inspired a number of studies of general penal populations.

One such study was made by Weiner¹¹ of the inmates of a security prison in Melbourne. The subjects were thirty-four tall prisoners, generally considered "hard to manage." Weiner found that four of these (11.8%) had XYY chromosomal constitutions. The study concluded that the "extra Y chromosome is associated with anti-social or criminal behavior which leads to confinement in an institution."¹²

Early efforts to study XYY males in the United States met with mixed results. A group led by Welch¹³ conducted a series of unsuccessful screenings in a prison population similar to those studied elsewhere. After finding only one XYY male among the 131 prisoners tested, Welch concluded that the results did not sufficiently substantiate a strong association between the XYY condition and aggressive behavior.

Other tests, however, in a variety of American mental and penal settings, yielded statistically significant results. Studies conducted by Mary Telfer¹⁴ and by Goodman¹⁵ confirmed the fact that XYY males are found both in institutions for the mentally defective, and in prisons, in numbers far above their incidence in the general population.

A recent analysis by Ernest Hook¹⁶ of studies undertaken in mental penal institutions classified twenty-one of these as positive (i.e. XYY incidence above the rate of incidence in the general population), five as negative, and one as indeterminate. Hook stressed that "the likelihood that this or a stronger trend in these studies occurred by chance alone is very small."

It is, of course, meaningless to study the statistical incidence of the

11. Weiner, Sutherland, Bartholomew and Hudson, *XYY Males in a Melbourne Prison*, 1 LANCET 150 [hereinafter cited as Weiner].

12. *Id.*

13. Welch, Borgaonkar and Herr, *Psychotherapy, Mental Deficiency, Aggressiveness and the XYY Syndrome*, 214 NATURE 500 (1967).

14. Telfer, Bauer, Clark and Richardson, *Incidence of Gross Chromosomal Errors Among Tall Criminal American Males*, 159 SCIENCE 1249 (1968).

15. Goodman, Smith and Migeon, *Sex Chromosome Abnormalities*, 216 NATURE 942 (1967).

16. Hook, *supra* note 2.

XYY Syndrome in mental and penal institutions unless there is some standard with which to compare it. The significant factor is not the incidence of the syndrome in these institutions, but the drastically increased prevalence as contrasted with the incidence in the general population. As was mentioned earlier, the Jacobs research team at Carstairs¹⁷ conducted tests which uncovered five XYY's in 3500 consecutive newborns (0.14%) and no XYY's among 2040 "normal" adult males. Ernest Hook has compiled an authoritative list of the more recent studies both of newborn males, and normal adults, and has found a pooled mean frequency of 1:975.¹⁸ He believes the true frequency to be about 1:1000 (0.10%). The most definitive study to date involved nearly 30,000 male births in five cities throughout the world.¹⁹ The study located 27 XYY's (1.1111 or 0.09%). These figures contrast sharply with the results of a compilation by Hook of 20 studies of mental penal settings, which were not biased by height restrictions. Hook found a pooled frequency of 1.89%, and a median figure of 2.05%.²⁰ He concluded that the frequency of the XYY Syndrome in mental penal settings is "about 20 times the pooled newborn rate of 0.10%."

Data such as this is statistically significant, but does not provide insight into the behavioral patterns of the XYY male. One of the most important attempts to do so was a follow-up study of the Carstairs population by Price and Whatmore.²¹ The subjects were the seven XYY's detected by the Jacobs study, plus two others identified by a later, more extensive screening. One of the nine XYY's was of average intelligence, with the remaining eight rated subnormal.

The study concluded that all nine were suffering from "severe personality disorders" the cause of which could not be determined. There was no evidence of brain damage, epilepsy, or other physical factors to account for this, and in fact, the only distinguishing physical characteristic of the XYY's was their unusual height. Similarly, except in one instance, there were no environmental factors which might have influenced their criminal behavior. One surprising result of the study was that the families of the XYY patients did not appear to have a history of criminal behavior patterns, whereas, the control group of eighteen genetically normal patients came from families displaying signif-

17. Jacobs, *supra* note 5.

18. Hook, *supra* note 2, at 140.

19. Boston Globe, Aug. 6, 1974, at 5, col. 1.

20. Hook, *supra* note 2, at 140.

21. Price and Whatmore, *Behavior Disorders and Pattern of Crime Among XYY Males Identified at a Maximum Security Hospital*, 1 BRITISH MEDICAL JOURNAL 533 (1967).

icant criminal patterns.²² The control group, with which XYY patients were compared, was randomly selected from the inmate population at Carstairs.

The study revealed two other significant differences between the XYY and control groups:²³ 1) The XYY males had committed relatively fewer crimes against person, and more against property, and 2) deviant behavior, as manifested by criminal convictions became apparent at an earlier age among XYY males. The XYY's were on an average, 13.1 years of age at the time of their first conviction. In comparison, the average age of the control group members at the time of their initial conviction was 18.

The nine XYY's studied were described in this way:

. . . extreme instability and irresponsibility . . . these men do not appear to have considered any but the most immediate consequences of their acts . . . They display an impaired awareness of their environment, which appears at least partly to account for their inability to respond appropriately to the ordinary requirements of life. Their greatest difficulty in social adjustment, however, resulted from emotional instability, combined with an incapacity to tolerate the mildest frustration.²⁴

Price and Whatmore concluded that "it seems reasonable to suggest that their anti-social behavior is due to the extra Y chromosome."²⁵

More recent behavioral studies of XYY individuals have, to a great extent, echoed the Price and Whatmore findings. Dr. Park S. Gerald, of the Boston Children's Hospital Medical Center, has noted the tendency of XYY males to over-react to situations: "When they are happy, its almost a rampage of happiness."²⁶ Dr. Gerald contended that it is the impulsive nature of XYY's rather than aggressiveness which leads to their behavioral difficulties. Dr. Hook reached a similar conclusion, stating that "increased impulsiveness rather than aggressiveness appears to be the relevant factor."²⁷

In general, XYY's discovered outside mental or penal institutions have not shown a significant tendency towards anti-social behavior. Only two out of eight such subjects listed by Hook displayed deviant characteristics. Montagu, however, described severe behavioral disorder manifested by a young XYY child.²⁸ The child progressed from

22. 17 of the 18 in the control group were of the XY genotype. The 18th refused to give a blood sample.

23. Price and Whatmore, *Criminal Behavior and the XYY Male*, 213 NATURE 815 (1967).

24. Price and Whatmore, *supra* note 21.

25. Price and Whatmore, *supra* note 23.

26. Boston Globe, *supra* note 19.

27. Hook, *supra* note 2, at 146.

28. Montagu, *supra* note 1, at 45.

smashing toys, ripping curtains, to kicking the family cat and setting fire to a room at age four and a half; and ultimately to ramming a screwdriver into a little girl's stomach at age five. The child's intelligence was average and he was often considerate and happy.

It is generally felt that a complex interaction of physical and environmental factors is at work in the XYY individual. Essential to a more complete understanding of the syndrome is the undertaking of maturation studies of XYY's detected at birth. Such studies should provide needed information on the relative contributions of genetic and environmental forces to deviant behavior.

XYY AND THE LAW

The XYY Syndrome poses a potentially serious challenge to the judicial system. Fundamental to our system of law is the concept of free will, and the underlying presumption that men have the capacity to conform their conduct to societal norms. If a causal relationship is established between genetic abnormalities and criminal behavior, the courts will be forced to deal with individuals incapable of controlling their behavior. To date, there is insufficient medical evidence to establish an absolute inability of XYY males to act in accordance with legal requirements. A number of XYY's have been uncovered leading relatively normal lives. Dr. Park Gerald has expressed the opinion that the XYY anomaly is not necessarily inconsistent with normal development. Nevertheless, it would not be unreasonable at this time to state that the presence of an extra Y chromosome, together with certain as yet unascertained environmental factors, substantially reduces an individual's capacity to conform his behavior to societal norms.

The legal community has historically distinguished those having diminished capacity to control their behavior through various "sanity" tests. It is likely, that if the XYY Syndrome is to gain legal recognition, these tests, or variants thereof, will have to be satisfied.

The test most commonly applied in the United States is the M'Naghten Rule.²⁹ It is frequently referred to as the right-wrong test. The rule requires that for a person to be relieved of criminal responsibility:

It must be clearly proved that, at the time of committing the act, the party accused was laboring under such a defect of reason, from disease of the mind, as not to know the nature and quality of the act he was doing, or if he did know it, that he did not know he was doing what was wrong.³⁰

The M'Naghten test has remained largely unchanged in many jurisdictions since its initial formulation in 1843. Evidence of the XYY con-

29. M'Naghten's Case, 8 Eng. Rep. 718 (1843).

30. *Id.* at 722.

dition might be admissible under this rule, as bearing upon a 'disease of the mind' i.e. a condition which creates difficulty in controlling anti-social behavior. But there is no reason to believe that an accused XYY male is incapable of recognizing the wrongful nature of his act. Unless some relationship can be established between chromosome abnormality, and defective perceptual powers, the XYY Syndrome will not, in itself, suffice to relieve an individual of responsibility.

A number of states have discarded the M'Naghten Rule in favor of the irresistible impulse test. Under this test, an individual would not be considered responsible if, though he knew his act wrongful, he was unable to control his actions because of a mental impairment. Jurisdictions utilizing this test might provide the opportunity for a successful defense based upon the XYY Syndrome. If the syndrome satisfies the requirement of mental disease or impairment, evidence of it should be admissible as bearing on the question of the individual's ability to control his behavior. It must be shown, that the XYY individual experiences considerable difficulty in preventing himself from behaving in an anti-social manner. Even this might not satisfy the requirement of the irresistible impulse test. The test is sometimes stated in absolute terms, requiring an individual's inability to control his actions. There is no indication that the XYY Syndrome could produce complete inability to control behavior.³¹

The success or failure of an insanity plea based upon the XYY Syndrome will, to a great extent, depend upon whom the burden of proof rests. In those jurisdictions in which the burden is upon the prosecution, and the defendant need only introduce evidence to rebut a presumption of sanity, the syndrome might serve as the basis of a sufficient defense. Where the burden of proof is upon the defendant to affirmatively prove lack of criminal responsibility, the condition will probably not suffice. Generally, under the irresistible impulse test, success is more likely than in jurisdictions where the M'Naghten Rule is imposed, but the probability of an adequate insanity defense based wholly upon the XYY Syndrome is not high.

A successful defense is more likely in the three jurisdictions³² which employ the Durham Rule, formulated in 1954 by Judge Bazelon. Under this test, the accused is not criminally responsible if he is suffering from a mental disease or defect, and his act was the product of the disease or defect. The term mental disease or defect was defined in *McDonald v. U.S.*³³ as "any abnormal condition of the mind which substan-

31. Boston Globe, *supra* note 19.

32. The three are Washington, D.C., New Hampshire, and Maine. The rule followed in N.H. differs slightly.

33. 312 F.2d 847, 851 (D.C. Cir. 1962).

tially affects mental or emotional processes and substantially impairs behavior controls." It would appear likely that the XYY Syndrome is within the scope of this definition. The Durham Rule also requires that the act be the product of the disease, i.e. the act would not have been committed, but for the disease. On the practical level, however, the accused is not required to establish this relationship. Under the product test, there is a presumption of sanity, which can be rebutted by the introduction of evidence of mental disease. Then, the burden is upon the prosecution to either disprove the existence of the disease, or the causal relationship between it and the act.³⁴ It is extremely difficult for the prosecution to disprove the causal relationship beyond a reasonable doubt, as required in criminal proceedings. If the courts can be satisfied that the XYY Syndrome is a mental defect or disease, a defense based upon it would have some likelihood of success.

Another test which is sometimes applied to determine criminal responsibility is the Currens test.³⁵ This standard was formulated by Judge Biggs in 1961. "The jury must be satisfied that at the time of committing the prohibited act, the defendant, as a result of mental disease or defect, lacked substantial capacity to conform his conduct to the requirements of the law which he is alleged to have violated." The Model Penal Code incorporates a similar provision: "A person is not responsible for criminal conduct if at the time of such conduct, as a result of mental disease or defect, he lacks substantial capacity either to appreciate the criminality of his conduct or to conform his conduct to the requirements of the law."³⁶

As is the case under the Durham Test, it must be shown that the XYY Syndrome qualifies as a mental disease or defect. The current state of research in the area would appear to support this contention. Lack of substantial capacity to conform his conduct to legal requirements could possibly be established by an XYY defendant. If it can be shown that the XYY individual has great difficulty in controlling his behavior, this might be sufficient, since the rule does not require complete lack of control.³⁷

USE OF THE XYY SYNDROME

To date, defenses based upon the XYY Syndrome have been rare, and have met with little success. The abnormality was first raised as a defense in France, during the murder trial of Daniel Hugon.³⁸ Hu-

34. *Frigillana v. United States*, 307 F.2d 665 (D.C. Cir. 1962).

35. *United States v. Currens*, 290 F.2d 751 (3rd Cir. 1961).

36. Model Penal Code § 4.01 (Proposed Official Draft, 1962).

37. *Id.*

38. *New York Times*, Oct. 15, 1968, at 5, col. 4.

gon was alleged to have strangled a sixty-five year old prostitute in a Paris hotel. A chromosome analysis made after an attempted suicide by Hugon revealed that he was an XYY. The defense introduced scientific evidence of a link between the presence of an extra Y chromosome and criminal behavior. Hugon was found legally sane, but the chromosome abnormality was considered by the jury as a mitigating factor during sentencing. The prosecutor asked for, and received, a lighter sentence than is usual for such crimes.³⁹

At the same time, a similar case was being tried in Australia. Twenty-one year old Lawrence Hannel was charged with the stabbing murder of his seventy-seven year old landlady.⁴⁰ The defense contended that Hannel was insane, and that his behavior was adversely affected by his XYY chromosome makeup. A study was introduced which indicated the existence of a strong correlation between the XYY condition, and violent criminal acts.⁴¹ After only eleven minutes of deliberation, the jury brought in a verdict of not guilty by reason of insanity, and committed Hannel to a maximum security hospital until cured. It is impossible to know what significance the jury attached to the XYY condition, since other evidence was introduced to show insanity in conventional psychiatric terms.

In the United States, defenses based upon chromosome abnormalities have failed to achieve even the limited recognition accorded them elsewhere. The most publicized American case which raised the defense was the murder trial of Sean Farley in New York.⁴² Farley was alleged to have brutally murdered and raped a forty year old woman. The defense made no attempt to deny the act. Instead, they based a plea of insanity upon Farley's XYY chromosome makeup. Farley exhibited all the symptoms of the XYY Syndrome. He was extremely tall and had a long history of aggressive anti-social behavior. Dr. E. Schutta, an expert in the field of genetics, described the physical and behavioral characteristics of XYY males, emphasizing their frequently aggressive nature, and testified to a belief that the XYY abnormality could have had a causory effect upon Farley's behavior pattern.⁴³ The prosecution asserted that Farley was sane under New York's version of the M'Nghten Rule, and had committed the crime in a drunken rage. They contended that no casual relationship existed between chromosome abnormality and criminal behavior. On cross examination, the prosecutor elicited from Dr. Schutta an admission that it is possible for

39. The prosecution asked for a 5-10 year sentence rather than the 15 years normally given for similar crimes. Hugon received a 7 year sentence.

40. New York Times, *supra* note 38.

41. Weiner, *supra* note 11.

42. People v. Farley, No. 1827 (Sup. Ct. Queens County, April 30, 1969).

43. New York Times, April 24, 1968, at 53, col. 1.

an XYY male to live a normal life. The question of sanity was submitted to a jury, which found Farley guilty and sentenced him to prison for twenty-five years to life.

In the Maryland case of *Millard v. State*⁴⁴ the XYY defense was not even considered sufficient to bring the question of sanity before the jury. Carl Ray Millard was an eighteen year old charged with robbery. The defense contended that the crime was the product of Millard's chromosome abnormality. Maryland utilizes a sanity test based upon the Model Penal Code which provides that a defendant is not responsible if he "lacks substantial capacity either to appreciate the criminality of his act, or to conform his conduct to the requirements of the law."⁴⁵ Under Maryland procedure, it was incumbent upon the defendant to introduce, out of the presence of the jury, sufficient evidence to rebut a presumption of sanity. Defense counsel attempted to show that individuals suffering from the XYY chromosome condition have extremely aggressive personalities "to the extent that most of them end up in jail for one reason or another because of their aggressive reactions."⁴⁶ A geneticist, Dr. Jacobson, testified that Millard's genetic abnormality was a mental defect which influenced "his competence or ability to recognize the area of his crime," and caused him to have a "propensity" toward crime.⁴⁷ Dr. Jacobson classified the defendant as insane in terms of "the ability to comprehend reality," and "inability to judge one's actions as far as consequence." The trial judge concluded that the defense had rebutted the presumption of sanity, and was prepared to allow the evidence to go to the jury. However, the prosecution prevailed upon him to hear the testimony of the state's psychiatrist, who argued that the XYY Syndrome was a physical rather than mental defect. After that, the trial judge ruled against presenting the evidence to the jury. Unfortunately, this precedent setting case was poorly argued by defense counsel. Counsel called only one expert witness, a geneticist, who admitted to having no training in psychiatry, and who was completely unfamiliar with legal standards for sanity in general, and the Maryland test in particular. When asked whether the alleged mental defect was such as to cause Millard to lack "substantial capacity either to appreciate the criminality of his conduct or to conform his conduct to the requirements of the law," Dr. Jacobson responded: "I cannot say that because I have not examined him as a psychiatrist. I have no competence in that area."⁴⁸ In affirming the decision on appeal, the opinion of the Maryland appellate court commented upon the

44. 8 Md. App. 419, 261 A.2d 227 (1970).

45. MD. CODE (1957), art. 59, § 9(a).

46. 8 Md. App. at 424, 261 A.2d at 229.

47. *Id.* at 425, 261 A.2d at 230.

48. *Id.* at 424, 261 A.2d at 229.

defense expert's "shallow" conception of the requirements of Maryland law, and concluded that "what is clear is that Dr. Jacobson's testimony was too general and lacking in specifics to form the basis for an opinion . . . we think Dr. Jacobson's opinion as to appellant's sanity under section 9(a) was not competent in that it was not based on reasonable medical certainty."⁴⁹ The failure of the defense to call a psychiatrist to deal with the sanity issue, as well as a geneticist to introduce the XYY Syndrome was quite possibly the reason this case was decided as it was.

In *People v. Tanner*⁵⁰ the XYY defense was found not to satisfy the requirements of California's version of the M'Naughten Rule. Defendant, Raymond Tanner pleaded guilty to a charge of assault with intent to commit murder, stemming from a brutal rape. Tanner was sent to Attascadero State Hospital for study as a possible mentally disordered sex offender. While at Attascadero, he was discovered to have the XYY chromosome defect, and attempted to change his guilty plea to not guilty by reason of insanity. The defense introduced expert witnesses and studies suggesting that XYY individuals are likely to exhibit certain aggressive behavioral traits. The state rebutted with testimony that Tanner was sane at the time of the offense. The trial judge refused to permit Tanner to change his plea, and this was affirmed on appeal. The appellate court found the defense's expert testimony deficient, in that it failed to show a reasonably certain causal connection between the syndrome and Tanner's criminal conduct, and second, that "none of the witnesses on genetics testified that possession of an extra Y chromosome results in mental disease which constitutes legal insanity under the California version of the M'Naughten Rule."⁵¹ The court went on to compare rejection of evidence of the XYY Syndrome, to rejection of expert evidence of voiceprints, Kell Celano blood grouping tests, statements under hypnosis, or sodium pentathol, and polygraph tests. It was recommended by the judge that Tanner serve his sentence at Attascadero, where studies of the XYY condition are underway.

As these cases indicate, the XYY Syndrome is as yet judicially unrecognized in the United States. It should be observed that Farley, Millard and Tanner were decided during a period when serious doubts were raised as to the validity of the association between genetic abnor-

49. *Id.*

50. 13 Ca. A.3d 596, 91 Cal. Rpt. 656, 42 A.L.R.3d 1408 (1970).

51. Cal. Jury Instr. (CALJIC) Civil § 801 (1967 Revision).

Insanity, as the word used in these instructions, means a diseased or deranged condition of the mind which renders a person incapable of knowing or understanding the nature and quality of his act, or unable to distinguish right from wrong in relation to that act.

malities and behavior. The Tanner court, for example, cited a newspaper article which stated that the "XYY criminal gene theory has been thoroughly discredited."⁵² It is possible that cases involving the XYY defense might be decided differently today. They would certainly benefit from the additional research conducted in the past few years, and from calmer emotional climate with respect to the concept of genetic criminals. Nevertheless, the decisions to date point out the need for further research into the XYY Syndrome. New scientific theories have always been regarded with skepticism by the courts, and presented with seemingly insurmountable barriers to recognition. Considerable time and study are needed to overcome the obstacles to admission. The cases also illustrated well the antiquated nature of our so-called sanity tests.

In a very real sense, the success or failure of an XYY defense will probably be dependent less upon scientific realities, than upon the semantic exercise of depicting chromosome abnormalities as deserving of the nebulous title, mental disease or defect. It is essential that both genetic, and conventional psychiatric evidence be introduced, and that all experts be fully aware in advance, of the nature of the 'sanity test' which they are required to overcome. The difficulties involved in molding nineteenth century formulations such as the M'Naghten Rule to the changing exigencies of modern behavioral science are formidable.

THE FUTURE OF THE XYY DEFENSE

For the moment, judicial recognition of the XYY Syndrome has been deferred, pending the outcome of future research. Possibly the present skepticism will be vindicated by the results of future tests, and the matter of genetic criminals can be put to rest. It is also possible, however, that behavioral studies will continue to indicate a strong correlation, and possibly a causal relationship between chromosome abnormalities and criminal behavior. If so, the courts must take some step to deal with the problem. The aims of society are not served by punishment of individuals incapable of controlling their behavior.

As has been shown, the present standards of criminal responsibility are not suitable for dealing with XYY individuals. One alternative which might be considered, is to recognize the diminished capacity of such persons and not hold them fully responsible for their actions. Under this approach, convicted XYY males would be found guilty, but would receive reduced sentences. Ideally, genetically abnormal offenders would be allowed to serve their sentences in institutions where re-

52. 13 Ca. A.3d at 599, 91 Cal. Rpt. at 658, 42 A.L.R.3d at 1411.

search and treatment of the XYY Syndrome is being conducted. This would serve at least to mitigate the harshness of imprisoning persons whose genetic makeup produces or contributes to an inability to conform their conduct to legal requirements. European and Australian courts followed this procedure in the cases of Hannel and Hugon. Realistically, however, a system of reduced sentences might well lead merely to early release of dangerous individuals, with little effort made to rehabilitate them. Considering the important role which many experts believe is played by environment in the behavior of XYY's, a term in prison would probably be more harmful than beneficial.

A possible response to the problem, would be simply recognize the special needs of XYY males, and allow a defense based upon the syndrome. The emphasis in such a system would be upon treatment rather than punishment. Defendants would be found not guilty by reason of lack of criminal responsibility, and determinations would be made on an individual basis as to the need for institutionalization. Studies have shown that a great many XYY's tend to commit petty property crimes, rather than dangerous aggressive acts. Non-violent XYY's could be treated on an out-patient basis, with the need for hospitalization based upon a balancing of the patient's interest in freedom, against the threat posed by him to society. A critical issue here, is the question of whether XYY offenders can be successfully treated.

In the past, there has been speculation that since the syndrome is genetic in nature, there can be no treatment of it, and the XYY individual will remain incorrigible regardless of the length or nature of his institutionalization. Proponents of this theory felt that nothing could be done for the patient, except to keep him sedated, and held securely away from society. Under this view, an offender fortunate enough to be classified as not responsible by the courts could look forward only to an indefinite stay in an institution. If in fact XYY's are not responsive to treatment, criminal commitment for even a petty offense would be the equivalent of a life sentence. This theory is no longer considered valid by knowledgeable persons. The abnormal chromosome pattern is merely one of many influences upon the behavior of an XYY individual. As Montagu stated:

Genes, chromosomes, or heredity are not to be interpreted as so many people mistakenly do, as equivalent to fate or predestination . . . Heredity is the expression not of what's given in one's genes at conception, but of the reciprocal interaction between the inherited genes, and the environments to which they've been exposed.⁵³

The XYY Syndrome may not be 'curable' in the sense of eliminating the problem, but research may indicate methods of counteracting some

53. Montagu, *supra* note 1, at 46.

of the environmental contributions toward deviant behavior. It is entirely possible that we can, in the words of Montagu, "do a great deal to change certain environmental conditions that may encourage XYY individual to commit criminal acts."⁵⁴

CONCLUSION

It is unlikely that the XYY Syndrome will win acceptance as a criminal defense in the near future. The judicial revolution which some observers expected to follow the discovery of the XYY male, is not at hand. At best, there has been a quiet acceptance in the scientific community of a correlation between presence of the defect, and anti-social behavior.

Many years of study may lie ahead before the exact relationship between genetic abnormalities and behavior is uncovered. The birth to death studies which some experts consider crucial could delay any real understanding of the syndrome's behavioral manifestations for generations. And, the large scale population tests which are necessary to determine the true incidence of the XYY are extremely costly.

However, it does seem clear at this point, that XYY individuals experience unusual difficulty in conforming their conduct to societal norms. At some point the courts will be obligated to take notice of this fact.

PAUL CHEVERIE

Agency and Licensing Problems In Reforming Group Credit Insurance Contracts

When a consumer purchases merchandise under a retail installment contract or executes a promissory note for money loaned, he is usually urged and sometimes required to purchase group credit insurance as part of the transaction. Because the writer of the policy retains a percentage of the premium as payment for placing the policy with the insurance company, salesmen and credit institutions often push the policy upon the buyer. Credit institutions sometimes require credit insurance coverage where the debtor is considered a poor credit risk. For example, a bank would require credit life insurance on an elderly person who borrows money in order to be assured of repayment if the debtor dies before the note is fully paid.

54. Montagu, *supra* note 1, at 49.