

## Crimino-Biologic Study of Patients with the XYY Syndrome and Klinefelter's Syndrome\*

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*Summary.* 12 psychopathic patients with chromosome aberrations found among 480 individuals in two institutions for criminal psychopaths in Denmark have been crimino-biologically investigated. 5 of these individuals have Klinefelter's syndrome, 5 are of the XYY karyotype, 1 is 46,XY/47,XY,?Xq—mosaic, and the remaining one is 46,?Xp—Y.

The mean age at first offence is 18.5 years; 83% are recidivists with the mean number of sentences being 7.0. The criminal acts of 5 patients with the XYY syndrome consist mainly of petty thieving, indecency and arson. The criminal offences of 5 patients with Klinefelter's syndrome is mainly petty thieving, sexual offences and less violent crimes. The relationships between the individual criminal life curve, age at first offence, number of sentences, criminality among siblings, milieu factors, intelligence, and psychiatric diagnosis are discussed.

Psychoinfantile personality is pronounced in 5 patients with Klinefelter's syndrome. Schizoid personality was remarkable in 3 patients with the XYY syndrome.

*Zusammenfassung.* 12 psychopathische Patienten mit Chromosomenaberrationen, die unter 480 Insassen von zwei Anstalten für kriminelle Psychopathen in Dänemark gefunden wurden, wurden kriminalbiologisch untersucht: 5 von ihnen hatten das Klinefelter-Syndrom, 5 zeigten den XYY-Karyotyp, 1 war 46,XY/47,XY,?Xq—Mosaik, der letzte war 46,?Xp—Y.

Das Durchschnittsalter bei dem ersten Vergehen war 18,5 Jahre; 83% wurden rückfällig; die durchschnittliche Zahl der Verurteilungen betrug 7,0. Die Vergehen der 5 Personen mit XYY-Syndrom bestanden vor allem aus geringfügigen Diebereien, Sittlichkeitsvergehen und Brandstiftung. Die Vergehen der 5 Patienten mit Klinefelter-Syndrom setzten sich vor allem zusammen aus geringfügigen Diebereien, sexuellen Vergehen und weniger gewaltsamen Vergehen. Die Beziehungen zwischen den individuellen Lebensläufen bezüglich der Kriminalität, dem Alter beim ersten Vergehen, der Zahl der Verurteilungen, der Kriminalität unter Geschwistern, den Milieufaktoren, der Intelligenz und der psychiatrischen Diagnose werden diskutiert. Bei 5 Patienten mit Klinefelter-Syndrom finden sich deutliche Zeichen einer „psychoinfantilen Persönlichkeit“. 3 Patienten mit XYY-Syndrom zeigten deutliche schizoide Züge.

### Introduction

The results of several cytogenetic and behavioural studies of patients with the XYY syndrome and Klinefelter's syndrome prompted us to investigate such individuals from the viewpoints of crimino-biology and psychiatry in more detail (Court-Brown, 1962; Jacobs *et al.*, 1965; Price *et al.*, 1966; Casey *et al.*, 1966a, b; Nielsen *et al.*, 1966; Price and Whatmore, 1967a, b; Nielsen, 1968; Wiener *et al.*, 1968; Court-Brown *et al.*, 1968). The main cytogenetic and psychiatric findings

\* The author dedicates this paper to emeritus Prof. Dr. S. Yoshimasu on his 70th birthday.

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of this study have been reported elsewhere by us (Nielsen *et al.*, 1969a, b); this presentation is concerned with the crimino-biologic aspects of the study.

### Materials and Methods

The cytogenetic investigation comprises two parts: 1. A prevalence and incidence study with chromosome examination of prisoners in the institution for criminal psychopaths at Horsens, a total of 325 men. 232 of these 325 men were examined. 2. A prevalence study of the XYY syndrome in prisoners in the institution for criminal psychopaths at Herstedvester, a total of 155 men. 37 of 42 men, who were more than 180 cm tall, were examined. In all, 480 individuals in the institutions for criminal psychopaths in Denmark in 1967—68 were studied.

12 patients (case no. 1—10 at Horsens; case no. 11 and 12 at Herstedvester), found to have chromosome aberrations, were crimino-biologically investigated.

### Case Histories

*Case no. 1*, 33 years old. Chromosome constitution of 47,XXY. The individual criminal life curve: Early ditropistic-succession-recidivist.

The father and 3 brothers had a criminal record. The mother was hysteric. The maternal grandmother suffered from manic depressive psychosis, and committed suicide together with her husband. Her 2 sisters were schizophrenic.

Delinquency began at age 9. The first sentence for stealing was at age 13, and 5 sentences for stealing occurred shortly thereafter. He stole mainly food and clothes which he actually needed from day to day by breaking into vacant summer houses. He escaped at least 15 times from youth prisons.

He was given the clinical diagnosis of weak-willed and spineless psychopathic personality with psychoinfantilism.

*Case no. 2*, 27 years old. 47,XXY. Late-monotropistic-first offender.

He grew up in a good and harmonious home, and worked as a farmhand from age 14 to 26. He had been drinking alcohol before all four cases of fire-setting at age 26. He had previously had some arguments with the owners of first two farms. The arsons were committed periodically, the intervals between the 4 acts were 2, 1 and 1 month, respectively. He has never been able to give any reason for his crime. It was never an act of revenge, and he obtained no sexual satisfaction by seeing fire. He committed arsons during alcohol intoxication.

Clinical diagnosis was weak-willed psychopathic personality with psychoinfantilism and borderline intelligence.

*Case no. 3*, 20 years old. 47,XXY. Early-polytropistic-succession-recidivist.

He grew up in a good and harmonious home. A brother of the father suffered from depression.

He committed stealing at age 16; he stole food and tobacco from summer houses and hotels. At age 17, after seeing a criminal film, he attacked and tried to rape a 15-year-old girl. He strangled her but was disturbed in the act by passers-by. Psychological testings show that the patient is hyperactive and impulsive in an uncritical way. He has hardly any possibility for introspection, and it is very difficult for him to foresee the consequences of his behaviour. He is hot-tempered, and often feels injured.

He was immature and primitive, and was diagnosed as weak-willed, unfeeling and explosive psychopathy with psychoinfantilism.

*Case no. 4*, 33 years old. 47,XXY. Early-polytropistic-succession-remission-recidivist.

He grew up in a good home, but the mother died when he was 16. At age 14, he committed two cases of indecency and stealing. He again committed house-breaking at age 19. He had a certain alcohol abuse at age 20. He had 6 sentences for stealing from age 20 to 25 within short intervals.

Psychological testings show that he has sexual difficulties, anxiety and immaturity. He has a low tolerance for stress and demands; he gives up and easily reacts with depression and anxiety. His stealing seems to have been made on sudden impulses irrespective of having a job and money or not.

Clinical diagnosis was weak-willed psychopathy with psychoinfantilism and alcohol abuse.

*Case no. 5, 44 years old. 47,XXY. Early-polytropic-succeSSION-RECIDIVIST.*

He grew up in a poor and dysharmonious home. 2 brothers had a criminal record. The father and mother were alcoholic; a sister and brother were admitted to a mental hospital.

His stealing began at age 8—9. He has received 9 sentences for stealing and embezzlement. The stealing before age 25 was mainly petty thieving; he committed summer house-breaking and stole food, spirits, clothes and goods. At age 30, he raped a 26-year-old woman threatening her with a knife, and also committed stealing on 42 occasions. At age 39, he committed stealing on 330 occasions within a relatively short period. He has occasionally committed wanton destruction in summer houses for which no sentences occurred.

He was immature, and was diagnosed as weak-willed, unfeeling and explosive psychopathy with psychoinfantilism. Morally insane.

*Case no. 6, 68 years old. 46,XY/47,XY, ?Xq— mosaic. Early-homotropic-succeSSION-REMISSION-RECIDIVIST.*

He grew up in a relatively good home, but his mother to whom he was tied died when he was 12 years old. Soon he began to steal at home. He was placed on a farm under child welfare guidance at age 13 because of stealing, and was sent to a home for hard-to-manage boys at age 15. He received 18 sentences from age 16 to 66, all were for stealing, receiving stolen goods, or for fraud.

He was immature, and had some neurotic symptoms but no sign of psychosis. He was given the diagnosis of weak-willed spineless psychopathy. He has spent most of his life from 13 to 68 in prisons or institutions. However, he once had a remission in his criminal life during age 55 to 58. He married a 47-year-old widow, was happy and did not commit any crimes. The marriage was dissolved 2 years later, and he again began to steal.

*Case no. 7, 41 years old. 46, ?Xp—Y. Early-homotropic-intermission-succeSSION-RECIDIVIST.*

He grew up in a fairly good and harmonious home. From age 14, he worked as a farmhand but changed his job on 14 occasions prior to age 24. At age 24, he broke into the room of another farmhand twice. At age 32, he tried to rape a 15-year-old girl. At age 35, he committed an indecency; at age 37, he again committed indecency on four occasions.

He was immature, primitive and passive. He was mentally retarded (moron), I.Q. was 75 and 80. From age 20, he had periodical alcohol abuse. He was given the diagnosis of weak-willed spineless psychopathy with mental retardation.

*Case no. 8, 28 years old. 47,XXY. Late-monotropic-succeSSION-RECIDIVIST.*

He grew up in a good and harmonious home. From age 19, he started drinking, and it seems that he has been drinking mainly through desire for company, shyness and inferiority feeling. He received treatment at the alcoholic clinic because he became an addictive alcoholic. At age 24 and 26, he made a suicidal attempt which took place while he was working in a ship where work was stressful. He was admitted to a mental hospital where he was given the diagnosis of character neurosis, depression and alcohol abuse. At age 26, he committed five cases of stealing; he stole tobacco, spirits and money in small amount.

At age 26, he complained of a feeling of insufficiency and inferiority which had been increasing in intensity for 4 years. He sometimes had anxious and obsessive compulsive neurotic states. At age 28, he was somewhat immature, and was given the diagnosis of character neurosis.

*Case no. 9, 26 years old. 47,XXY. Early-ditropic-first offender.*

He grew up in a very good and harmonious home. He was quite different from his brothers and sisters; he had 7 years' compulsory schooling while all his 11 siblings received a high-school education. He often drank quite heavily from age 20, apparently mainly in order to get into

contact with other people. However, he always became more introverted and more depressed with greater contact difficulties during alcohol intoxication.

His exhibitionism started at age 15, he obtained sexual satisfaction by this act. At age 23, he opened the kitchen gas-cocks in the house where he was living together with four people. At age 23 and 24, he committed fire-setting on three occasions in the house where he was living. The patient considers the arson as an attempt at suicide. He never thought of harming any one. He was intoxicated on all occasions except one. He obtained no direct sexual satisfaction from committing arson. The motive of arson is not clear, probably partly a result of suicidal drives.

He was immature, insecure, and had no warm feelings towards others. He was given the diagnosis of schizoid psychopathy.

*Case no. 10, 35 years old. 47,XYY. Early-ditropistic-succession-recidivist.*

He grew up in an unstable home; his father was insecure, unstable in mood, and hot-tempered, and the mother was nervous and insecure. His younger brother committed stealing and homosexuality. A sister of the mother suffered from schizophrenia; a cousin was manic, and another cousin schizophrenic. A sister and brother of the father had convulsions. An uncle of the father suffered from manic depressive psychosis, and another uncle committed suicide.

At age 15, he committed stealing. From then up to 35, he received 12 sentences for stealing and 2 for embezzlement within very short intervals. His stealing was petty thieving; he stole mainly food, tobacco, beer and bike most often in small amount. At age of 16—17, he was often sexually aggressive towards girls of his age. At age 18, he had two occasions of indecency. He has spent nearly all of his life from 15 to 35 in prisons.

He was immature, primitive and has had periods of dysphoria with and without external causes. He is easily irritated, hot-tempered and aggressive. He was given the diagnosis of weak-willed, unfeeling and explosive psychopathy.

*Case no. 11, 35 years old. 47,XYY. Early-polytropicistic-succession-recidivist.*

The father was unknown. The mother and her 2 sisters suffered from epilepsy. A sister is mentally retarded, and another sister was placed under child welfare guidance. He grew up in orphan's and private homes. He had destructive violent behaviour at age 6, and was judged to have a low intelligence level, in the range of moron. He was placed in an institution for the mentally retarded where he remained until age 25. He committed arson in the institution at age 7, and wantonly destroyed institutional property on several occasions. At age 16, he again committed arson. From age 16 up to 22, he escaped 12 times from institutions, and during these periods broke into summer houses. At age 22, he ate pieces of glass; the motive was probably against the institution authorities. At age 25, he threw a piece of iron at a male nurse which resulted in an injury which required 6 weeks to recover. He was sentenced for stealing at age 23, 27 and 29. He broke into summer houses and stole food, tobacco and clothes most often in small amount. At age 35, he committed arson on three occasions.

He was immature, primitive and had no warm feelings towards others, no sympathy, no critical insight into his own crimes. He was not mentally ill, nor mentally retarded. He was diagnosed as schizoid psychopathy.

*Case no. 12, 27 years old. 47,XYY. Early-polytropicistic-succession-recidivist.*

He grew up in a cold and unfriendly dysharmonious home. The father received a sentence for stealing at age 45, and the mother had personality deviation. He has 2 brothers; an elder brother committed petty thieving at puberty, and a younger brother committed stealing and indecency.

At age 13, he stole some sweets together with his younger brother. At age 15, he made an indecent advance to a 6-year-old girl. At age 17, he received his first sentence for indecency and stealing. He received another sentence for stealing at age 18. He was sentenced for indecency, stealing and two occasions of arson at age 19. During parole at age 23, he again committed stealing, wanton destruction in summer houses, indecency and an attack on an old woman.

He was psychopathic, and showed a massive lack of feelings towards others. He was given the diagnosis of schizoid psychopathy.

## Results and Discussion

### 1. Prevalence and Incidence of Chromosome Aberrations

10 of 232 men examined in the prevalence and incidence study at Horsens had chromosome aberrations, giving a frequency of 3,1% of the total of 325 men. 5 patients (1,5%) were of the XXY sex chromosome constitution, 3 patients (0,9%) were XYY, and the other 2 patients were 46,XY/47,XY, ?Xq—mosaic and 46, ?Xp—Y, respectively.

2 of 37 men examined in the prevalence study at Herstedvester had the XYY sex chromosome constitution, giving a frequency of 1,3% of the total of 155 men.

The pooled data show that 12 patients of 269 men examined were chromosomally abnormal, giving a frequency of 2,5% of the total 480 individuals. This figure correlates with those between 1,8—2,9% found by Bartlett *et al.* (1968), Clark (1969), Murken (1969) and Marinello *et al.* (1969). All these figures are significantly higher than in the general male population.

### 2. Age

The ages of 12 patients ranged from 20 to 68 with the mean age of 35.3 years.

### 3. First Offender and Recidivist

1 patient with the XYY syndrome and 1 with Klinefelter's syndrome were first offenders; the other 10 patients had from 2 to 18 sentences with the mean number of sentences being 7.0.

### 4. Age at the First Criminal Offence

Age at first criminal offence of 12 patients was 18.5; the ages range from 13 to 26 years.

10 of 12 patients (83%) committed their first crimes before age 25 (early criminality according to Stumpfl (1935) and Yoshimasu (1958)). This frequency is statistically higher than 56% found in all criminals in Denmark (Nordbek, 1946). 8 of 12 patients committed their first offences before age 18 (67%), compared with 66% in patients with normal chromosome constitution at Herstedvester. These values are significantly higher than 15% in all male criminals in Denmark (Nordbek, 1946). Price and Whatmore (1967a, b) reported an earlier age for first offence in XYY patients than in control. In the present study, 8 patients with first offence before age 16 are all recidivists with the mean number of sentences of 8.1. In 4 patients with first offence after age 16, 2 are first offenders and 2 are recidivists with 2 and 3 sentences. These results indicate that early starting criminals have a recidivistic tendency. Our patients were selected; these two institutions accept only psychopathic criminals. As shown by the author (1959, 1965), recidivists have a higher frequency of early criminality (78% and 83%), so the early criminality in the present study might be a characteristic sign of recidivists. The patients with sex chromosome aberrations might be critical especially at puberty. The author observed such patients who grew up without any difficulties until puberty, and when they reached at puberty, they have suddenly had feelings of insufficiency (most probably sexually) and committed

sexual or larcenous crimes. Therefore, this is one of the reasons for their early criminality especially between ages 13 to 17.

The mean age at first criminal offence in 5 patients with the XYY syndrome was 18.6, in 5 patients with Klinefelter's syndrome was 17.0, and in the other 2 patients was 18.0 years. There are no great differences between those mean ages.

### 5. Type of Crimes

The total sentences of 12 patients were 89, if each sentence was calculated. Some individuals had 2 or more sentences at the same time (Table 1). Distribution of sentences are shown in Table 2. The mean number of total sentences for 12 patients was 7.4, including 5.8 sentences per man against property, especially stealing (5.3); 0.9 for sexual crimes; 0.3 for violent offences, and 0.4 of arson.

The frequency of criminal offences against property in the patients is apparently higher, and of violent offences is lower than in prisoners at Horsens as well as

Table 1. *Distribution by total sentences of 12 patients with chromosome aberrations*

Sentence	Total <i>n</i> = 12	XYY syndrome <i>n</i> = 5	Klinefelter's syndrome <i>n</i> = 5	Others <i>n</i> = 2
Against property	69 (5,8)	24 (4,8)	25 (5,0)	20 (10,0)
Stealing	63 (5,3)	22	23	18
Embezzlement	4	2	2	0
Fraud	2	0	0	2
Violent criminality	3 (0,3)	2 (0,4)	1 (0,2)	0
Murder	2	1	1	0
Assault	1	1	0	0
Sexual criminality	11 (0,9)	5 (1,0)	3 (0,6)	3 (1,5)
Rape	3	0	2	1
Indecency	8	5	1	2
Arson	5 (0,4)	4 (0,8)	1 (0,2)	0
Others	1	0	0	1
Total	89 (7,4)	35 (7,0)	30 (6,0)	24 (12,0)

The figures in parenthesis are the mean numbers of sentence per man.

Table 2. *Distribution by type of sentence in per cent among patients with chromosome aberrations and controls*

Sentence	XYY syn- drome <i>n</i> = 5	XXY syn- drome <i>n</i> = 5	Total <i>n</i> = 12	Psycho- pathic <i>n</i> = 161 <sup>a</sup>	Oligo- phrenic <i>n</i> = 256 <sup>b</sup>	Not oligo- phrenic <i>n</i> = 3313 <sup>b</sup>
Against property	68,6	83,4	77,4	68,6	59,0	75,0
Sexual crime	14,3	10,0	12,4	17,5	27,0	12,7
Violent crime	5,7	3,3	3,4	9,8	1,9	8,8
Arson	11,4	3,3	5,6	4,1	10,2	} 0,6 <sup>c</sup>
Others	—	—	1,2	—	1,9	

<sup>a</sup> After Widmer (1962), <sup>b</sup> after Nordbek (1946), <sup>c</sup> calculated using the frequency in 1938.

in all male criminals (Widmer, 1962, and Nordbek, 1946). Arson and sexual offences are, in general, very often committed by the mentally retarded (Nordbek, 1946) as shown in Table 2. Distribution by crimes in the present patients is to a certain extent similar to that in the mentally retarded. The mean I.Q. of 4 patients who committed arson is 96.8; and of 7 patients who committed sexual offences is 97.6. These mean I.Q.s are not different from the mean I.Q. of all of the patients (94.4). The mean I.Q.s of patients with the XYY syndrome for various types of crimes in previous studies are 81.0 for stealing (11 patients), 80.5 for sexual crimes (4 patients), and 86.0 for aggressive crimes (4 patients). No remarkable difference among these I.Q.s exist as shown in the present study.

#### Stealing

9 patients committed one or more acts of stealing with a range of 1 to 18 sentences. 8 of these patients were involved in petty thieving. These criminal offences are type of passive, primitive and asthenic criminality which are influenced by their immature and primitive personalities. The criminal acts of case no. 5 are different from the other patients; his stealing is very active, for instance, at age 39, he stole on 330 occasions. He is morally insane.

None of 12 patients had an offence of robbery. Petty thieving and no robbery are characteristic of patients with chromosome aberrations.

#### Sexual Offences

7 patients committed sexual offences, and 1 of them was not given any sentence. Case no. 5 committed rape, and case no. 3 and 7 made an attempt of rape. Case nos. 4, 7, 10 and 12 were indecent to girls. They committed 15 sexual offences with 11 sentences; 12 acts were committed before age 25, and 3 at ages of 30 to 38. The victims of these 15 offences with one exception were girls under age 15. The most frequent type of sexual offences is indecency (8 sentences by 5 patients).

All patients had sexual inferiority and/or a feeling of insufficiency. Sexual weak potency exists especially in 5 patients with Klinefelter's syndrome. Ambivalence between strong sexual libido and weak potency exists in 5 patients with the XYY syndrome. All patients are psychoinfantile, and had contact difficulty with persons especially with women. This accounts for their choice of young girls to participate in sexual acts, above all in indecency.

#### Violent Offences

Case no. 9 committed an attempt of murder in connection with fire-setting. Case no. 3 committed murder in connection with an attempt of rape. Case no. 12 attacked an old woman. However, none of 12 patients committed any real murder or bodily injury.

#### Destructive Crimes

*Arson.* A patient with Klinefelter's syndrome committed arson during alcohol intoxication. 3 patients with the XYY syndrome committed arson (60%). The motive of arson in case no. 9 is not clear, but probably partly a result of suicidal drives. In case no. 11, arson at age 7 could have been a childish reaction; at age 16, it was probably aggression against institution authorities; at age 35, it was an

aggression-repression reaction. The relationship between hidden aggressivity and arson in 2 patients with the XYY syndrome (case nos. 11 and 12) has been previously discussed elsewhere by us (Nielsen *et al.*, 1969b).

*Wanton Destruction.* Wanton destruction was committed as aggression against property; this act in case no. 11 was done against the institution authorities.

#### Escape

The motive in this act in 4 patients is most probably aggression against the institution authorities and the routine of regular prison life.

### 6. Criminality of Patients with the XYY Syndrome

#### Frequency of a Criminal Record in Patients with the XYY Syndrome

Nearly all individuals with the XYY syndrome and a criminal record thus far reported have been found among patients in special security hospitals or prisons. No data on the frequency of individuals with a criminal record among the general population of persons with the XYY syndrome are available.

#### Frequency of Patients with the XYY Syndrome among Criminals

A significantly higher frequency of patients with the XYY syndrome among criminals than in the general male population (ca. 1 in 700—1000 men, Ratcliffe *et al.*, 1970) has been reported. The reported frequencies vary from 1% to 12% (Wiener *et al.*, 1968) and 24% (Casey *et al.*, 1966a, b), but a frequency between 1—3% is commonly reported by others (Jacobs *et al.*, 1965; Price and Whatmore, 1967a, b; Bartlett *et al.*, 1968; Court-Brown *et al.*, 1968; Nielsen *et al.*, 1968; Clark, 1969; Murken, 1969; and Marinello *et al.*, 1969).

The frequencies of 0.9% found in the prevalence-incidence at Horsens, and 1.3% in the prevalence at Herstedvester correlate with figures in previous studies.

#### Criminality

Distribution by crimes of the pooled 45 patients, where type of crimes has been reported, reveals 24 stealings, 1 fraud, 1 robbery; 5 rapes, 4 homosexualities, 1 indecency; 5 assaults, 4 murders; 5 arsons; and 1 absconder (Jacobs *et al.*, 1965; Richards and Stewart, 1966; Price and Whatmore, 1967a, b; Kelly *et al.*, 1967; Persson, 1967; Telfer *et al.*, 1968; Wiener *et al.*, 1968; Leff and Scott, 1968; Hunter, 1968; Court-Brown *et al.*, 1968; Bartlett *et al.*, 1968; Nielsen *et al.*, 1968; and Murken, 1969). The most frequent crimes are clearly stealing, sexual and aggressive crimes.

The most frequent types of crimes in the present patients are petty thieving (vacant summer house-breaking), indecency and arson. This correlates to a certain extent with the pooled data of previous studies. The high frequency of house-breaking and less criminality against persons was also reported by Price *et al.* (1966). Previous authors have not found a high frequency of indecency and arson. However, this is also the characteristic findings of patients with the XYY syndrome, and the backgrounds of these criminal offences have been discussed. Several patients have been reported as aggressive or explosive in behaviour but the types of crimes were not shown (Goodman *et al.*, 1967; Court-Brown *et al.*,



1968; Forssman *et al.*, 1968; Leff and Scott, 1968; Lisker *et al.*, 1968; Yanagisawa, 1968; Hashi *et al.*, 1969; and Marinello *et al.*, 1969).

Some patients direct their aggressivity against articles (wanton destruction) rather than persons. Patients reported by Mintzer *et al.* (1968) and Cowie and Kahn (1968) committed destruction. Some suicidal attempts have been considered to be autoaggressive reactions.

### 7. Criminality of Patients with Klinefelter's Syndrome

#### Frequency of a Criminal Record among Patients with Klinefelter's Syndrome

Among 411 patients with Klinefelter's syndrome in the pooled 48 studies, 51 patients had a criminal record (12.4%) (Nielsen, 1969).

#### Frequency of Patients with Klinefelter's Syndrome among Criminals

A frequency between 1.0 and 2.2% has been reported by Casey *et al.* (1966 a, b), Lambert (1966), Bartlett *et al.* (1968), Clark (1969) and Murken (1969). The 1.5% found at Horsens in the present study correlates with those of previous studies. The pooled frequency is 1.8% or 68 of 3837 men, this is significantly higher than in the general male population (ca. 1 in 500). Wegmann and Smith (1963), however, found only 2 patients among 1318 young male delinquents and felons (0.15%), which is slightly lower than in the general male population.

### Criminality

As the most frequent types of crimes, Court-Brown (1962) reported larceny, arson and indecency; Kvale and Fishman (1965) found larceny, assault and homosexuality; and Hunter (1966) reported sexual, aggressive and larcenous crimes. Significantly higher frequencies of sexual offences (Mosier *et al.*, 1960), and of aggressive offences (Hunter, 1966) in the patients than in controls have been described. While, Casey *et al.* (1966 a, b) found no significant difference of types of offences between patients with Klinefelter's syndrome and controls.

Distribution by criminal offences of the 54 patients with reported crimes (Züblin, 1953; Money and Pollitt, 1964; Karl and Meyer, 1964; Hoaken *et al.*, 1964; Crowley, 1965; Lambert, 1966; Bartlett *et al.*, 1968; Nielsen, 1969; and Murken, 1969) reveals 30 stealings, 2 robberies; 8 indecencies, 5 homosexualities, 3 rapes, 4 sexual attacks, 2 rape and murders, 2 transvestisms, 1 pedophilia; 2 murders, 1 violence; and 6 arsons. The most frequent types of crimes are apparently stealing, sexual offences and less violent crimes. Our findings in the present study correlate with the pooled data of previous studies.

### 8. Criminal Direction

Type of criminal offences is divided into 5 categories (Yoshimasu, 1958), namely:

1. Crimes against property, for instance, stealing, fraud, embezzlement, etc.
2. Violent offences, for example, murder, bodily injury, assault, etc.
3. Sexual offences, for example, rape, indecency, homosexuality, etc.
4. Destructive crimes, for example, arson, etc.
5. Escape.

Criminal direction can be classified as follows:

Criminal direction	Offensed crimes of
1. Monotropistic . . . . .	only one type
2. Homotropistic . . . . .	two or more types in one category
3. Ditropistic . . . . .	two categories
4. Polytropistic . . . . .	three or more categories

Criminal directions in 12 patients are polytropistic in 5, ditropistic in 2, homotropistic in 3, and monotropistic in 2.

9. Intervals between Criminal Offences

Interval between criminal offences is the period from release to the next offence (Yoshimasu, 1958; modified by the author), and is classified as follows:

1. Succession . . . . . Period until 2.5 years
2. Remission . . . . . Period from 2.5 to 5 years
3. Intermission . . . . . Period over 5 years
4. Combination of succession, remission, intermission

Intervals in 10 recidivists are succession in 7, succession-remission in 2, and succession-intermission in 1.

10. Individual Criminal Life Curve

The individual criminal life curve is illustrated in Fig. 1. The curve rises, if one commits an offence, and after release from prison it goes down. If one again commits a crime within a 2.5 year-interval, the curve goes down to the first level; with a 2.5—5 year-interval, it goes down to the middle level; and if no offences are committed within a 5 year-interval, the curve returns to a prior equal to that before the commitment of the first offence (succession, remission, intermission, respectively). The types of crimes are shown on the shoulder of the curve. The individual criminal life curves of 12 patients are shown in Table 3.

7 patients who grew up in dysharmonious and/or broken homes are recidivists who have received from 4 to 18 sentences with the mean number of 9.1. They

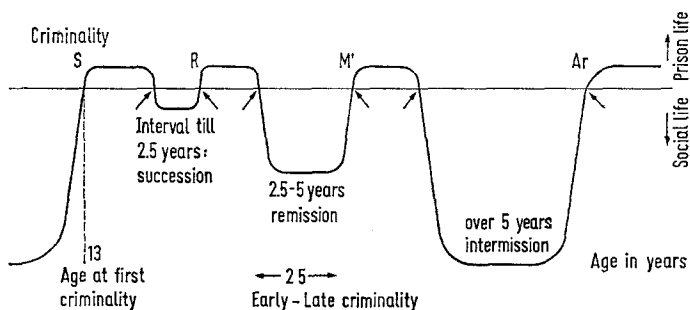
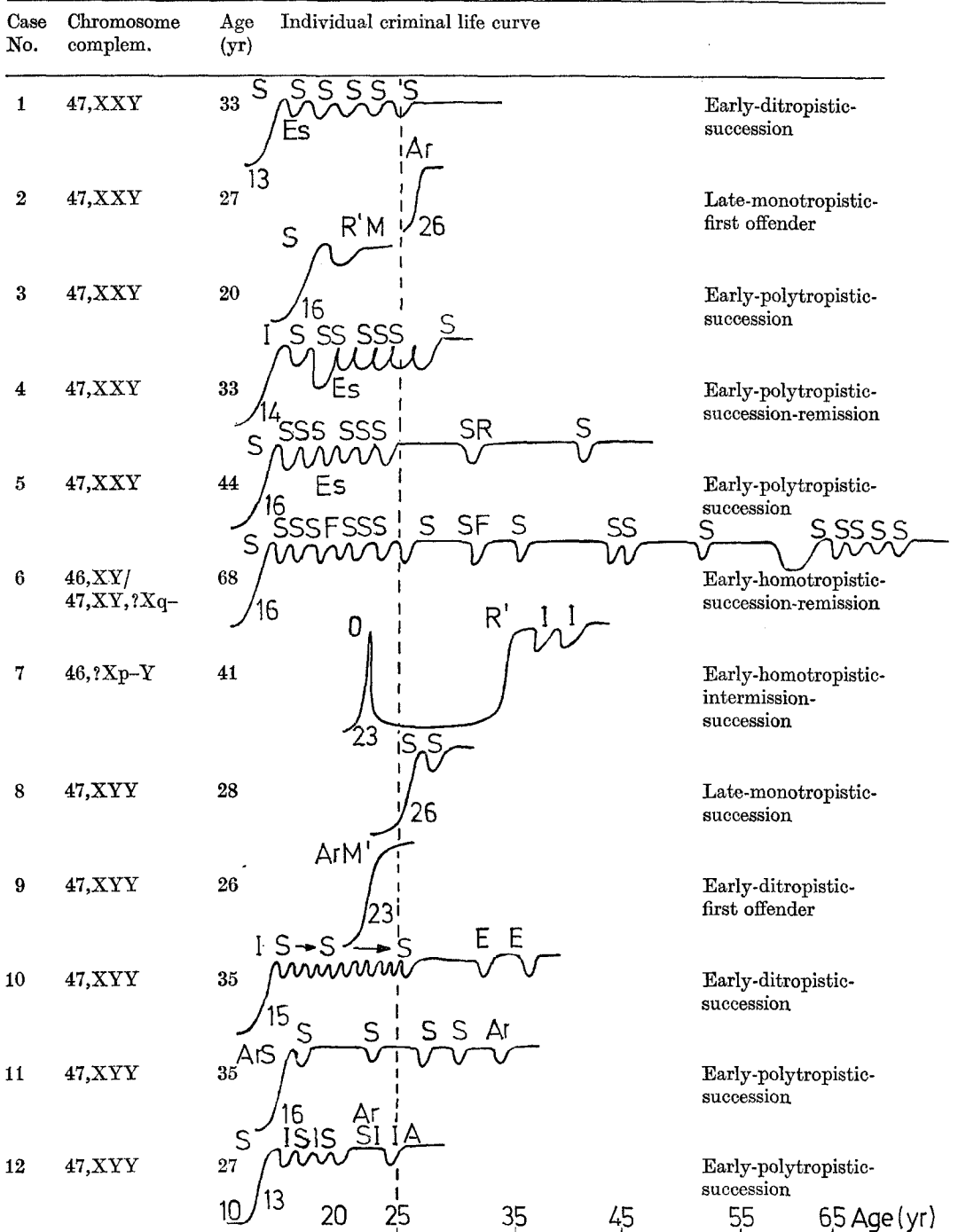


Fig. 1. Individual criminal life curve. Criminality: S: stealing, R: rape, M': attempt murder, Ar: arson. ↗: release, ↘: again commit

Table 3. *Karyotype, individual criminal life curve, psychiatric*



Criminality: S: stealing, E: embezzlement, F: fraud, R: rape, I: indecency, M: murder, A: assault, Ar: arson, Es: escape. Milieu: dysh: dysharmonious.

*diagnosis, intelligence, milieu, family history and stature*

Psychiatric diagnosis	I.Q.	Milieu	Family history		Stature (cm)
			Criminals	Psychosis	
will-weak, spineless, psychoinfantile	97	dysh	+	+	182
will-weak, periodic dysphoric, psychoinfantile	72	good	—	—	178
will-weak, unfeeling, explosive, psychoinfantile	90	good	—	+	181
will-weak, alcohol abuse, psychoinfantile	90	broken	—	—	174
will-weak, unfeeling, explosive, psychoinfantile	105	dysh	+	+	181
will-weak, spineless	nor	dysh	—	—	173
will-weak, spineless, moron	80	good	—	—	176
anxious, obsessive-compulsive	93	good	—	—	182
schizoid	100	good	—	—	193
will-weak, unfeeling, explosive, psychoinfantile	96	dysh	+	+	181
schizoid	93	dysh	+	+	185
schizoid	122	dysh	+	+	188

all are early criminals with the mean age of 14.3 years at first offence. Their criminal directions are polytropic and ditropic. They all show succession in intervals. The individual criminal life curves are thus of the early-polytropic-succession type.

5 patients who grew up in good and harmonious homes had rather relaxed criminal life curve as seen in case nos. 2, 3, 7, 8 and 9 in Table 3. They were later starting (the mean age of 22.8 years at first criminal offence); 2 were first offenders and other 3 had only 2—3 sentences. Their criminal directions were rather simple.

### 11. Criminality among Relatives

2 of 11 fathers (high treason and stealing), none of 12 mothers, 8 of 36 brothers (stealing in 8, indecency in 1, and homosexuality in 1), and 1 of 32 sisters (stealing) had a criminal record. The criminal offences in the relatives are of minor severity, a passing phenomenon, and consist mainly of petty thieving (*milieu criminality*). None of them were placed in an institution for criminal psychopaths. No difference is found in a frequency of a criminal record in siblings of patients with the XYY syndrome (27.3% or 3 of 11 brothers) and Klinefelter's syndrome (29.4% or 5 of 17 brothers).

### 12. Mental Illness among Relatives

6 patients (50%) had a family history of mental illness as shown in case histories. A high frequency found in the present study, including schizophrenia, manic depressive psychosis, epilepsy, psychopathic personality, and suicide correlates with the findings reported by the author (1959, 1965) among others. However, direct correlation between criminality and family history of psychosis has not been confirmed.

### 13. Milieu

The above-mentioned difference between the individual criminal life curve and criminal behaviours of the patients who grew up in disharmonious and harmonious homes indicates importance of milieu. Criminal behaviours of the patients were apparently more severe than in their siblings. This difference indicates that the patients received a stronger influence from environment because of their psycho-infantile personality with chromosome aberrations.

5 patients who grew up in good and harmonious homes have a lower mean I.Q. (87.0) than the others (100.5), and they committed first offence later than the others (22.8 and 14.3 years). These findings indicate that they are protected by their families. 4 of these 5 patients (case nos. 2, 7, 8 and 9) had a history of alcohol abuse. Alcohol abuse apparently prompted those patients in criminal offences. They have thus received a strong influence from milieu (alcohol). Marinello *et al.* (1969) reported 4 patients with the XYY syndrome, all of whom came from broken or unsatisfactory homes.

8 of 12 brothers (67%) and 1 of 18 sisters (6%) of 7 patients who grew up in disharmonious and/or broken homes had a criminal record. On the other hand, none of 24 brothers and none of 18 sisters of 5 patients who grew up in good homes committed offences. These findings also indicate importance of milieu.

#### *14. Marriage*

4 patients (case nos. 6, 7, 10 and 12) had a history of marriage, 1 of whom was a father (case no. 10). A happy marriage has a criminality repression effect (Yoshimasu, 1958; among others). Patients with Klinefelter's syndrome had, however, weak sexual libido and weak potency, and patients with the XYY syndrome had strong sexual libido and weak potency; as a consequence they would not appear promising candidates for a happy and stable marital life. Case no. 6 had a remission in his criminal life during marriage, but he has neither Klinefelter's syndrome nor the XYY syndrome.

#### *15. Neuropathic Symptoms in Childhood*

5 patients (42%) exhibited some neuropathic symptom: case no. 2 had nail biting, headache with dizziness; case nos. 6 and 8 enuresis; case no. 9 stuttering; case no. 10 childhood convulsions. A high frequency found in the present study correlates with the finding reported by the author (1959).

#### *16. Tattooing*

3 patients had tattooing (case nos. 1, 5 and 10). Tattooing of naked girls, snake, heart and names of girls on the body, extremities and penis apparently indicate their primitive and immature personality.

#### *17. Laboratory Findings*

##### Electroencephalogram (EEG)

3 patients with the XYY syndrome and all 4 patients with Klinefelter's syndrome and case no. 7 had a normal EEG. 2 patients with the XYY syndrome (case nos. 8 and 10) showed a slightly abnormal record. Case no. 6 had a borderline record. In all, 2 of 10 patients showed EEG abnormality.

##### Testis

4 patients with Klinefelter's syndrome, none of 5 patients with the XYY syndrome, and none of the other 2 patients had small and soft testes. Case no. 5 rejected a physical examination.

#### *18. Neurological Abnormality*

None of 12 patients exhibited neurological abnormality.

#### *19. Intelligence*

The mean I.Q. of 12 patients except one is 94.4; this is not conspicuously different from that of other prisoners at the institutions. The mean I.Q.s of patients who committed sexual offences or arson are not lower than the mean of all patients. This is also confirmed in patients with the XYY syndrome in previous studies. These results show no correlation between type of criminality and intelligence in the patients, even if their criminality patterns are similar to those of the

mentally retarded. The latter similarity is probably a reflection of their psychoinfantile personalities rather than mental retardation.

The mean I.Q. of 5 patients with Klinefelter's syndrome (90.8) is not different from that found in patients studied by Hambert (1966) and Nielsen (1969). The mean I.Q. of 5 patients with the XYY syndrome (100.8) is higher than the 85 found in 29 patients in previous studies, but not different from the 99 found in 9 patients reported by Nielsen and Tsuboi, (1969). This difference may reflect the fact that some patients in previous studies were discovered among criminals with subnormal intelligence.

### 20. *Psychiatric Diagnosis*

All patients were psychoinfantile; this was especially pronounced for 5 patients with Klinefelter's syndrome. Schizoid trait was pronounced for 3 patients with the XYY syndrome. As types of psychopathic personality, weak-willed, spineless, explosive and unfeeling behaviours were most remarkable. A more detailed description of personality and discussion is given elsewhere by us (Nielsen *et al.*, 1969a, b).

### 21. *Late Maturity, Treatment and Prognosis*

The immature, weak-willed spineless psychopathic personality will mature and stabilize with age so that they gradually adjust to society after a happy marriage, getting children, having stable occupation, etc. The author observed this late maturity among criminals, where it most often occurred between age 20 to 35. However, patients with psychoinfantile personality with chromosome aberrations would not be expected to mature with age, and their character disorder will most probably become more evident and social maladjustment will become more pronounced around age 30. The prognosis is very dark, if they do not obtain adequate hormone and psychiatric treatment in due time. This problem will be discussed in another paper.

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