SYMPTOMATIC EPILEPSY IN ONE OF IDENTICAL TWINS *

A STUDY OF THE EPILEPTIC CHARACTER

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INTRODUCTION

TWINS have thrown light upon many problems in medicine. There are certain diseases that almost inevitably develop in both of identical twins and at about the same period of life, even though the two individuals are living amid different surroundings. This rule applies particularly to nervous and mental diseases, though many other constitutional diseases have been reported as occurring in both of identical twins.† The frequency of identical disorders in dissimilar twins is considerably greater than it is in siblings, but does not approach the figures for identical twins. It is for these reasons that any alteration occurring in one of identical twins is of such importance for the study of the collateral phenomena. For instance, Jenkins ¹ recently reported a case in which one of identical twins received a birth injury with consequent choreoathetosis and slowing of mental development. The injured girl was three grades below her twin at school, and presented a difference of 15 points (79-64) in the I.Q. at nine years. The healthy twin was more outgoing, aggressive and responsive, and her weaker sister suffered greatly by comparison. She was so quiet, shy and reticent that testing required twice as long. She was unable to compete successfully with the normal twin in physical activity and when they fought, Lena won. Ida was more responsive to praise.

This pair of twins furnished an opportunity for determining what intellectual and emotional manifestations were due to the cerebral injury and what effects the comparison of the stronger twin with the weaker might have in the subsequent development of the two individuals. Jenkins emphasized the devastating effects of twin rivalry upon the weaker sister ('Ida has no individuality except in her deficiencies') but he did not report any detailed character analysis of Lena. This is to be regretted, since her injured twin suffered from convulsions in infancy.

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† For a study of this subject see Wilson, S. A. K., and Wolfsohn, J. M., 'Organic Nervous Disease in Identical Twins,' *Arch. Neurol. and Psychiat.*, 1929, **21**, 477.

TWINS AND EPILEPSY

It is generally agreed that something in the constitutional 'make-up', the X-factor of Lennox and Cobb,² is necessary for the development of epilepsy, even in those patients that develop seizures only after cerebral injury. This X-factor must be present in the healthy twin as well as in the epileptic twin, since both of them are developed from the same ovum. The following case of a pair of identical twins, one of whom suffered from a cerebral lesion at an early age with subsequent epileptic attacks, while the other escaped, furnishes important data upon the question whether the so-called epileptic psyche is a primary character deviation, or whether it is secondary to the repeated cerebral insults. Of the two individuals inheriting the same genetic pattern, subjected to the same environment, one suffers an experiment of Nature while the other serves as a control. Such a perfect experiment is seldom realized in human beings. If there is an inherent character defect, an epileptic psyche, it should be present in pure form in the uninjured twin. For once, the study of the healthy individual is just as important as the study of the diseased one. Fortunately, this has been possible. Would epilepsy develop in the healthy twin, should she suffer from a serious cerebral injury later?

Epilepsy in twins is not very frequently reported, but the Rosanoffs,³ in their superb collection of 1,011 sets of twins with some neurological or psychiatric defect, found 107 cases in which epilepsy affected one or both twins. The distribution of these cases is given in Table 1.

TABLE 1
Epilepsy in Twins—Rosanoff Cases

Type of twins	Number of cases	One affected	Both affected
Monozygotic males	9	4	5
Monozygotic females	14	5	9
Same sex, dizygotic males	15	12	3
Same sex, dizygotic females	24	20	4
Opposite sex, dizygotic	45	32	13
Totals	107	73	34

There are many important points discussed in this paper, such as vulnerability of the nervous system, prematurity, trauma, sex-linked disturbances, etc., which make it a contribution of the first rank. A discussion of the 'epileptic character,' however, is not included. Three case-histories of epilepsy in one of identical twins are given.

In the 4,280 Swiss epileptics studied by Stroessler⁴ there were 45 cases in one of twins, and in the three monozygous cases both were affected. Many

other cases must be discarded because of the early death of one twin, but possibly the author's cases 31 and 38 are instances of epilepsy in one of identical twins. The data concerning trauma and even of homozygosity are incomplete, however, and there is no information concerning the character of the normal twin. Shanahan⁵ found 38 out of 8,024 epileptics to have been one of twins, but did not pursue further the question of personality in either the normal or the diseased twin.

The nearest approach to a study of the normal twin is found in Lange's⁶ classic monograph, *Verbrechen als Schicksal*. Among his 13 pairs of identical twins both were criminals in 10 instances. Study of the discordant examples reveals indications of cerebral injury occurring to the delinquent twin in two of the three cases, and his Xaver Ball suffered from epileptic attacks during childhood. When these twins were studied, at 50 years of age, Xaver had been imprisoned for 24 years for the murder of his mistress during what appears to have been an 'epileptic equivalent.' The murder was particularly brutal, and was preceded and followed by sound sleep. Xaver was the first born. He had a large hæmatoma that subsided spontaneously. Between two and four years of age he was tossed by a cow and for several years had nocturnal epileptic attacks that finally ceased spontaneously. At the age of 10 he manifested a compulsive orderliness. Somewhat later he fell out of a hayloft to the barn floor, a distance of six metres, was unconscious, and remained in bed for a week. Physical examination upon imprisonment revealed paresis of the right internal rectus muscle, and deviation of the tongue to the left. The brother Johann showed no such defect. Both boys were stupid, one of their teachers saying that even the intellect was equally divided between them. 'They capered like kids on the street. Xaver was less open. The twin brother could talk, was freer, livelier and qualified to play the host, although he was lazier. Xaver, on the other hand, could not talk with people, was monosyllabic, gruff, bristling, but was industrious, orderly, and yet less judicious.' Johann was a farmer of irreproachable character; Xaver had a good prison record.

There is not enough in the published record for adequate character analysis of the healthy twin, and in the affected one the diagnosis of epilepsy is not altogether positive, the convulsive seizures having ceased before adolescence.

The main objection to implicit reliance upon the material in this study for final decision upon the question of the epileptic character is the symptomatic nature of the epilepsy, since some writers are inclined to delineate the epileptic character only in cases of 'essential' epilepsy. Most authors, however, agree that the epileptic character appears equally well in the 'idiopathic' and in the symptomatic cases, provided the damage to the brain is not of such degree as to interfere seriously with the other cerebral functions. Even Clark⁷ states that these patients with symptomatic epilepsy take refuge in narcissism, that the injury is a wound to the ego's sense of well-being,

that energy is withdrawn to swell the bubble of self-satisfaction and that there is an inbinding of tension within the ego. The attacks, originally due to the lesion, become automatic discharges of this tension.

THE EPILEPTIC CHARACTER

The epileptic character has been subjected to study by many investigators. Clark⁸ states: '... there is invariably present an epileptic constitution or make-up in those individuals who later develop essential epilepsy. The nucleus of this personality defect is a temperament of extreme hypersensitiveness and egotism and all that these two main characteristics entail.' These traits make the possessor incapable of social adaptation. The seizure, Clark maintains, is due to the sufferer's inability to subordinate his individualistic tendencies to social demands. The patient reacts by periodic unconsciousness.

Characterizations of the epileptic personality are many and various, but most authors do not specify, as Clark does, that the deviations are already present in the preconvulsive era. White⁹ views the epileptics as a group as morose, irritable, suspicious and hypochondriacal. Kretschmer¹⁰ terms them coarse, brutal, tense, explosive, abrupt, and inclined to affective crises. Doolittle¹¹ in a recent study emphasizes the irritability, the supersensitiveness, the religiosity and the narcissism, and says that epileptics are rather subject to outbursts of rage. He cautions against accepting this delineation without reserve, however, since this type of reaction is by no means universal in epileptics, while it also occurs in individuals that have never had convulsive seizures. A somewhat different attitude is maintained by Shanahan,⁵ who explains much of the behaviour of the epileptics as a response to anxiety and apprehension concerning the attacks, and to breaking down of the morale of the epileptic due both to the restrictions placed upon him and to the attitude of society. Turner¹² likewise believes that the behaviour of the epileptic is conditioned by his disease rather than existing as a primary defect. Since epilepsy sets in, usually, at an early and impressionable age, the childish reactions persist, while in the case of older individuals the morale is broken down. Doolittle emphasizes the fact that the character alterations in epilepsy, the egocentricity, the irritability and the 'absent' attitude increase as deterioration progresses, until the whole personality is extinguished and the patient deteriorates to the vegetative level of existence.

From the above excerpts it is apparent that there is no uniformity of opinion as to just what constitutes the epileptic personality. Many of the phenomena may well be secondary to the epilepsy, conditioned by the repeated cerebral insults. The fact that epileptic deterioration is not highly correlated either with the severity of the individual attacks or with the number of attacks is beside the point, since in a study of personality it is not deterioration but the original endowment that is under consideration. This original endowment, it is repeated, is the fundamental consideration, and while some

impression may be gained from detailed study of the pre-epileptic personality, there is always a great deal of gratuity in the erection of an adult personality upon the remembered childish traits. Taking as the point of departure Clark's delineation—narcissism and supersensitiveness—one might add certain other traits that may or may not depend upon the epilepsy, such as rigidity of thought and character, pedantry, religiosity; finally superadding such traits as seem definitely to spring from the disease of the brain, such as irritability, furors, suspiciousness and anxiety, lack of interest and forgetfulness. The subjoined study of twin sisters may well show which of the above characteristics are primary and which are secondary.

CASE REPORT

Twin sisters (termed Patient and Sister) are now 25 years of age. Both of them have unmistakable similarities, not only in physique, colour of eyes and hair, texture of skin, shape of ears and hands, but also in tone of voice, a peculiar fluttering of the eyelids and marked readiness for tears to flow on slight provocation. Finger-prints are almost identical. There was a single placenta. Patient is 3 cm. shorter than her sister, slightly lighter, is left-handed and her hair grows counter-clockwise. Sister's hair grows clockwise and she is right-handed. Both of them have followed an exceptionally similar career, attending convent school, then becoming telephone operators, voluntarily returning to different convents at different times and finally leaving again to resume work at the switchboard. Both of them are married, Patient to an Army sergeant, the other to an ex-Marine sergeant, and neither has children. The father died accidentally, the mother suffers from diabetes, and an older sister died of typhoid fever. There is no history of epilepsy, mental defect or psychosis, migraine or urticaria in the family.

Patient weighed 5½ lb. at birth, a pound less than Sister, was the second to come—a rapid, normal vertex presentation. Her face was enclosed in the membranes but the cord was not round the neck. She cried lustily, and nursed normally, as did Sister. Both developed normally to the age of eight months, when, during very hot weather, and in the course of a digestive upset, Patient had several convulsions. Sister escaped. From this time on it was noticed that Patient was somewhat less vigorous than Sister, talking and walking two months later. She was less responsive, a little flabby. They were devoted to one another, tending from the beginning to shut out childhood friends and even other members of the family. Sister was the leader, showed more initiative and more stamina, and was able to get along better with other children. Patient followed her lead but often assumed the observer's rôle while Sister was playing with other children. In primary school they kept pace, but Patient was rated lower in the class than Sister. There were fights and arguments, but no real twin rivalry is remembered. Sister felt superior to Patient, but Patient did not feel inferior to Sister. They shared the same bed and each masturbated for a year before finding out that the other was doing likewise. Neither of them was forward with other children, Patient showing less initiative and poorer judgment in her choice of companions. Sister had a much more lively fantasy life, telling tall tales that had a profound effect upon her impressionable but less alert twin. At one period they played hermit and alternately prayed and tilled the soil in the back yard, subsisting on cold canned beans. Once they spent many hours in a church where the sacrament was exposed, praying and expecting Christ to appear before them. At the age of seven Patient began to suffer from two or three attacks of petit mal a week, but no severe attacks.

Patient contracted typhoid fever at the age of nine, her older sister dying of the disease, her twin escaping the infection. On this account Patient lost a whole year

of schooling. After the illness it was noticed that the right leg was smaller and did not develop as rapidly as the left, so that she limped to a trifling degree. Soon thereafter, both girls were placed in a convent. They were deeply religious, and enjoyed the peace and routine of convent life. They matured within two months of one another. Upon leaving the convent, at different times, they both became telephone operators. The reaction of the girls to their work was decidedly different, however. Patient was quite satisfied to go along with the routine of completing calls, while Sister was irritated by the monotony, harassed by the constant repetition of the same manoeuvres, and finally gave up her position to re-enter the convent. Patient continued for a while, but at the age of 17 she accepted an invitation of two men in an automobile, was taken to the outskirts of the city and raped. She developed pyosalpinx, requiring operation, and shortly thereafter voluntarily entered a different convent intending to become a nun. She seems to have accepted the raping as an unfortunate and disagreeable occurrence, but her self-respect was not upset by it.

Neither twin found the expected peace of mind in the convent. Patient was distressed to find that the sisters had human failings, and that the other girls were quite worldly-minded, while Sister had unwittingly immured herself in a home for wayward girls, and had to escape by stratagem. Sister resumed her telephone job until Patient left the convent, resigning for her sake to become telephone operator in an affiliated hospital. Patient has continued to work as night telephone operator in this hospital until the present time, enjoying the opportunity thus offered to read a rather high type of fiction and philosophy and to indulge in inconsequential conversation with the nocturnal prowlers about the hospital. Sister used her spare time to assist in clerical work, took a course in laboratory technique, and is now senior technician.

Patient married two years earlier than Sister a somewhat coarse type of individual with whom she had relations before marriage, accompanied by mingled distress and pleasure. Sister's husband is also a rather gross individual who frequently embarrasses her in public. Both of them have had some difficulty in adjusting to marriage. Patient runs her establishment methodically, does much of the work, pays the bills. Sister shares the work and responsibility with her husband, and is a better housekeeper. Sister is probably more highly sexed than Patient. Sister avoids pregnancy while Patient desires it greatly on the grounds of her religious beliefs. Patient is still a devout Catholic and is distressed at the attitude of Sister. Sister's experience at the convent left her quite bitter against the Catholic church. When she married, however, she sought help in this direction. When this was denied because her fiancé was divorced she joined the Reformed Catholics, and has taken an active interest in theosophy. From the standpoint of religiosity, I gain the impression that both are deeply interested, and that the divergence of views is conditioned by varying experiences, but that Sister has been more aggressive in seeking a satisfactory outlet for her devotional sentiments.

Study of the two sisters from the standpoint of personality is rather easy. Both are very open and free in the discussion of intimate details. Each sees in the other a number of traits that differ from her own. Each thinks the other egotistical. Probably both are affected in much the same degree, but Sister has more accomplishments to her credit. Patient is rather easy-going, preferring to give in, even though she knows she is being imposed upon, rather than assert herself. Sister is self-assertive, jealous of her position in the laboratory, somewhat difficult to manage, preferring to force others to conform to her ideas. Sister makes up her mind quickly and acts upon it; Patient is docile. Sister imposes her will upon Patient with little regard to the niceties of situations. Patient usually represses her reactions to disagreeable events, while Sister flares up and gets it over. Patient stores up her dislikes, and occasionally goes into a rage with tears of vexation. Patient is deeply affected by beautiful music, works of art, scenery. One day she told with great disgust how, while she was admiring

the scenery, her husband seemed interested only in the legs 'and other things' of passing women. Quite frequently while engaged in contemplation of some pleasurable experience, Patient has a petit mal attack. Sister is more matter-of-fact, enjoys things without losing herself in them, and is more interested in people than Patient is. Patient admits the superior abilities of Sister, and acknowledges that she has made good use of her time, but mentions the fact that she supplied the money for Sister to take her laboratory course and has not been repaid. She feels that she has grown in moral stature, while Sister has fallen away, since leaving the convent. Of the two, Sister has greater feelings of inferiority when comparing herself with other people. Sister's devotion to Patient is quite touching. With tears in her eyes she says: 'I'd do everything in my power to teach Mary all I know. You don't realize how close to each other twins can be. She is part of myself. Yet I know she can't do the things I can; she hasn't got it in her.'

Intellectually, and despite restricted educational opportunities, Sister gives the impression of being more alert and capable, while Patient is rather dull. The dullness is probably due partly to lack of appreciation of external things, partly to preoccupation. Patient has little curiosity. She takes her spells rather calmly, follows directions implicitly, telephones frequently to report progress, keeps methodical notes on her diet, fluid intakes, and time, location and incidents pertaining to the seizures. Her conversation is notably lacking in sparkle.

Psychometric examinations were carried out by Dr. Thomas V. Moore, to whom I am indebted for the following findings. The tests were made in 1925 when the girls were 16½ years of age.

	<i>Patient</i>	<i>Sister</i>
Binet-Stanford	13 years, 6 months	14 years, 8 months
I.Q.	82	92
Healey A	14 seconds	23 seconds
Rating	16 years plus	16 years
Mare and foal	15 seconds	46 seconds
Rating	15 years plus	8 years plus
Knox cube	8 seconds	8 seconds
Rating	16 years	16 years
Seguin form board	19 seconds	26 seconds
Rating	15 „	20 „
	15 „	18 „
	11 years	9 years
Writing	Clear, legible, less regular than Sister	Well formed, clear, spelling perfect
Reading	Third reader fluently with expression	Third reader fluently with expression
Arithmetic	Mistakes with change at \$1.00. Prompt with multiplication table	Prompt in making change up to \$5.00

Patient has had only one major seizure. This occurred during hot weather following a petit mal attack. The head and eyes were drawn to the right, and the convulsion, at first limited to the right side, later became generalized. There was no foaming, biting of the tongue, or involuntary evacuation, and only slight cyanosis. Following the convulsion, she rose, walked across the room, bumped into the sofa, slept all day and awoke late at night with headache and confusion. Examination the next day revealed slight weakness of the right side of the face. The right hand was somewhat smaller and more hypotonic than its fellow, weaker in the grip, but not noticeably slower in fine rapid movements. Reflexes and sensibility were normal in

the two hands. The abdominal reflexes were not obtained on the right. The patellar and achilles reflexes were increased on the right, with ankle clonus and a positive Babinski sign. This foot was smaller and shorter than its fellow, and the sense of position was slightly impaired in the great toe.

Previous examinations by two competent neurologists had discovered no abnormalities in the reflexes, and subsequent examinations over a period of several months have not revealed the signs that were present at the first examination, except for the smaller size of the right hand and foot. Both of them seem to be altogether equivalent to their fellows on the left, and there is no noticeable limping in walking. As already noted, Patient is left-handed.

COMMENT

The underlying process is probably ancient cortical scarring, presumably due to cortical venous thrombosis coincident with the first convulsive seizures in infancy. Petit mal attacks occurred before the typhoid fever, but the shortening of the right lower limb was noted only subsequent to this. While petit mal attacks continue at the rate of about two a week, only one major seizure has occurred in all the subsequent years. Only following this attack did the characteristic neurological signs appear. Sensory Jacksonian attacks without loss of consciousness have recently developed, alternating with the petit mal attacks, or coming in little showers. The paræsthesias begin about the right corner of the mouth and extend to the right hand and foot.

The character traits possessed in common by these two young women appear to consist of rather marked egocentricity and a deep religious feeling. Both of them are probably more sensitive than the average, and both of them have attained an adequate intellectual level.

Whether religiosity should be included among the signs of the epileptic character is debatable. Küffner's¹³ study seems to indicate that it is a conditioned response; he cites experiences in Soviet Russia where epileptics are no longer God-fearing. He finds one epileptic out of four to be 'religious,' believes that the primary egocentric attitude with pedantic colouring is responsible, and that in other epileptics devotion to the theatre or to art may be a different expression of the same character trend. The early religious training of these two young women, their mother being a convert to Catholicism, might well have instilled a profound devotion in them. It is of interest that the tendency remains in Sister though the expression has changed, while in Patient, in spite of disillusionment, intense devotion remains unaltered.

Differences in the sisters are easily recognized because of the possibility of ready comparison with one another. Patient may be said to react to her cerebral disorder by less initiative, satisfaction with self and surroundings, performance by rote, interest in her inner experiences. She suppresses immediate reactions and treasures up a load of emotionally charged material that may later break down in an episode of sustained irritability and stubbornness, or explosive resentment. She exhibits slowing-up of intellectual processes; and, finally, petit mal attacks. Patient has a more rigid personality than her sister, is less willing to experiment in either thinking or acting,

shows poorer judgment in her contacts with others, and is less self-assertive, preferring to suffer imposition rather than stand on her rights.

CONCLUSIONS

The differentiation between primary and secondary manifestations of the epileptic character is made possible by the study of identical twins, one of whom had suffered a cerebral injury in early life with little neurological defect and no deterioration.

Egocentricity is the outstanding feature. In the normal twin this has led to considerable accomplishment in spite of educational handicaps, while in the affected individual it has led to satisfaction with self and surroundings. Supersensitiveness is even more marked in the normal twin than in the patient.

The question of religiosity is not altogether determined by this study on account of the strong and early training of both individuals.

All other phenomena that are not more or less directly correlated with the egocentricity would seem to be secondary to the disease. Such character traits as mental and physical inertia, performance by rote, explosive reactivity, suspension of affect, unproductivity and inelasticity of intellectual processes would seem to depend upon the damage sustained by the brain accompanying either the original trauma, or the repeated insults of petit mal.

Sibling rivalry as a cause of stunting of the personality does not appear to be a prominent feature in this pair of identical twins.

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