Rehabilitation Institute of Montreal - Canada

Twins and Cerebral Palsy a Combined Study[1, 2]

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Location and object of the study

Conducted at the Rehabilitation Institute of Montreal, this survey involved three pairs of identical twins; one in each set with cerebral palsy.

Occasion

The study derives from a project covering 250 cases of cerebral palsy, followed during the past seven years. Features were sufficient to warrant an independent paper.

The co-twin method: Its advantages

The co-twin method, based on bio-genetical, clinical and comparative studies, permits physiological analyses of physical and mental development.

In encephalopathy, the advantage is two-fold.

It points out hereditary, genetical and environmental etiology:

1. Monozygotic twins, originating from a single ovum, are *the same individual* in duplicate. However, if the physical and-or mental picture is not a *mirror-like* one, discrepancies may originate from environmental influences, resulting from pathological conditions acting upon one or both twins during pregnancy, at birth or later.

2. The method illustrates to what extent disease modifies development. This is striking in cerebral palsy, which produces varied degrees of motor, sensory, psychological and mental dysfunctions. It is impossible to verify *what a child would have been*, if exempted from a pathological condition, and the method has the unique advantage of producing a perfect witness: the normal twin.

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[2] Il presente lavoro sarà pubblicato in lingua francese dalla consorella « Union Medical du Canada », n. di Giugno 1958 (*n.d.r.*).

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Incidence

Gordon Allen states that all studies related to twins should be based on analysis of twin samples chosen from a large number of sample cases (3 cases of cerebral palsy in our study) rather than from a large number of twins. Only then can the sample be compared with a large population. This comparison may be valid either in terms of dual birth frequency or in terms of proportion of twins within the sample. In our research, the twin samples were chosen from 250 cases.

Allen's studies have determined that the incidence of twins is 2.19%. However, due to a higher mortality rate, greater in identical than fraternal twins, the percentage of living individuals at school age is 1.4%. In final analysis, and to compare the frequency of twins in the sample and of the twin pairs between 1 and 5 years of age, 1% remains constant.

The incidence of cerebral palsy in twins has been studied by several authors: Benda found 9.2%; Greenspan and Deaver 7%; Yue 9%. The latter mentions that 70% of births involving cerebral palsy were premature and that in 23 sets, 13 first-born displayed pathological phenomena.

The 250 cases — the sample group — were originally selected at screening for *rehabilitation purposes.* Therefore, this number excludes instances where one twin died. Consequently, the number of twins studied here has no statistical value.

Methodology

All children were subjected to physiatric, psychiatric and psychological studies as well as tests involving activities of daily living. In each instance, the study was completed by electroencephalograms, still and motion pictures.

The investigations included psychological and psychiatric evaluations of parents.

The psychiatrist interviewed the parents together or, as in one case, separately The children were always seen together; the interviews were conducted according to Menninger's method.

The psychological evaluation was based on:

1. Determination of I.Q. (Goodenough, Terman, Barbeau-Pinard [2] tests);
2. Free drawing content;
3. Projective tests (Machover and Self tests);
4. Interviews with the patients and parents.

The investigations were carried and individual findings drawn independently, previous to discussion of conclusions.

[2] A French expression intelligence test, equivalent to the Wechsler-Bellevue, developed at the Institute of Psychology, University of Montreal.

Identification of Monozygotic twins

The following criteria were used:

1. Circumstances of delivery: Of little value.
2. Clinical observations: Based on the similarity of sexes and morphology. Colour of eyes, hair, odontological characteristics and various measurements were used in an attempt to establish somatotype.
3. Laboratory findings: Electroencephalographic studies.
4. Psychological selective tests: Accepted as a criteria in identification.

Presentation and identification

Sets are designated as No. 1, 2 and 3. In each « A » represents the affected child; « B » the witness brother or sister.

TWIN SET NO. 1.

Sex: Female.
Present age: 8 years 9 months.
Delivery: Premature, 7 months 1 week.
Complication: Early prolapse of the umbilical cord.
First born: « A » Weight: 3 lbs. 4 oz.
Second born: « B » Weight: 3 lbs. 8 oz.
Moter development: Grossly, same in both.
Recognition of dissimilarity: By the parents; « A » walked 2 months later than « B » with an unsteady gait.
Schooling: Both in 3rd grade. « B » heads the class; « A » lags at the end.
Milieu: Always lived together, participating to the same activities.

Electroencephalographic studies (Fig. 2)

In both, the rhythm varies between 10.5 - 11.5 c/sec.
« A » shows:

1. Asymmetry over the right fronto-central region;
2. Epileptogenic discharges of slow spike and wave, as well as high voltage sharp waves

In « B »: No abnormality.

Physical examination

The children are almost identical in appearance; they had to be labelled during evaluations.

A slighty asymmetry is noted over the entire body of « A », who is 1 inch shorter than « B » and weighs nearly 3 lbs. less. The heightcalf ration, devised by Massler

Twin set No. 1.

« A » Fig. 1 « B »

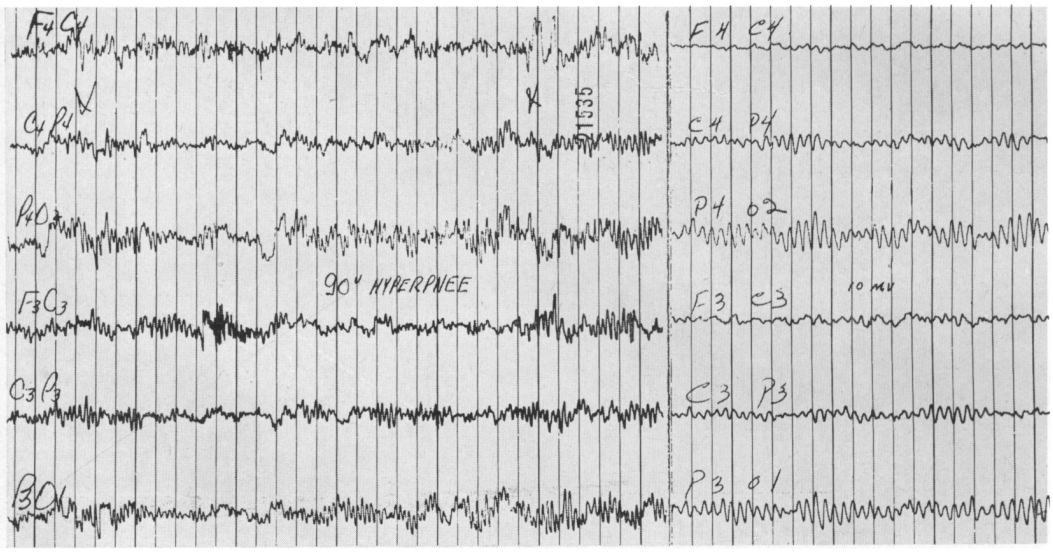

Fig. 2

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and Suher, reveals that both may be classified in the very slender group, their somatotype, therefore, shows strong ectomorphism.

Examination demonstrated normal posture.

The investigation further reveals a slight left spastic hemiparesis in « A », evident in the lower extremity only in selective circumstances. The circumference of the left leg is ½" smaller than the right.

« A » is right-handed; « B » is ambidextrous but favours the left hand.

A series of motor ability tests were conducted: lacing shoes, opening doors, hammering nails, throwing and catching a ball. Lower extremity discrepancies were observed when walking, turning about, running, jumping and kicking a ball.

Treatment

No formal treatment indicated; interpretation and counselling were dispensed to the parents.

Psychological findings

Intellectual levels: The Terman showed a slight difference and the Goodenough one of 15 in I.Q., in favour of « B ».

Handedness: In drawings, « A » is left and « B » is right handed.

Personality: In the free test, « A » displays more infantilism, and in the Machover and Self tests, projects her handicap in the drawings. As she draws less attention in the family circle, she has become demonstrative and exuberant. The Machover demonstrated female identification but also a strong super-ego. However, in the Self test, she is more efficient and inclines towards masculinity. This is confirmed during the interview with the father, who over-emphasizes his daughter's achievements.

Personality Components: Seen separately, they appeared to have similar behaviour pattern. Both are hyperactive, lack diplomacy and show a strong super-ego. The mother over-estimates the learning abilities of her daughters, forces them to study for ever better results at school and thus please her.

Psychiatric findings

Besides physical similarity, « A » and « B » have consonant names, are curious and inquisitive, without shyness and timidity. Both compete for attention and find identification with their mother difficult. The relative appreciation by the parents was contradictory at times, specially when non-objective components such as emotions were assessed.

Emotionally: « B » is a teaser; she gives in readily to her sister, apparently through pity. She is boyish, ambitious, sucks her thumb and, while walking, has a compulsion to step over the sidewalk markings. « A » is more dependent on « B »; more sensitive, impulsive and aggressive, though the mother stated that she is a *happy-go-lucky* child. She is a bad loser but *does not care* if her sister succeeds

better at school. Unpleasant memories linger in her mind. Finally, she shows more consideration towards younger children.

In Action: « B » is more energetic and constant; she likes to organize, is more sociable but somewhat domineering. « A » prefers dolls, is more persistent in play, slower in her actions and less sociable.

The Parents: (History of Denial)

The father is quiet and realistic. Objectively, he realizes that the discrepancies between the twins are not great. The mother is nervous, worried, and a perfectionist. « There is no difference between my daughters », she said, since she equates disability and inferiority; disability meaning even lack of intelligence. She refused to believe the doctor who first noted disparities. Indeed, there is no common understanding of the problem, and for all practical purposes, the father has resigned himself to the wife's stronger will. The mother is the main figure in her daughters' development; she visualizes them similar, denies the reality of cerebral palsy, and since she wishes to conceal this from others, will even report « B »'s *neurotic traits* (tics) to the teacher in an effort to disguise the cerebral palsy. The defect being small, this attitude will encourage the child to conceal it by avoiding competitive situations where it may become evident: « They run, but I don't care about such activity myself ». From this, one may theorize as to whether marriage, for instance, may be contemplated at a later date by the patient.

The mother is contradictory when she states that there is no character resemblance. She has pride for « B » and sympathy for « A ».

The paramount findings concerning the C.P. child appear to be related to denial, concealment and an attitude of indifference, as a defence mechanism.

TWIN SET No. 2

Sex: Male.
Present Age: 6 years and 2 months.
Delivery: Premature at 7½ months.
Complications: None.
First-born: « A » Weight: 4 lbs. 8 oz.
Second born: « B » Weight: 5 lbs. 7 oz.
Motor development: Grossly, same in both.

Recognition of dissimilarity: Here again, unsteady gait aroused suspicion. The parents noted that although both children were toilet trained during the daytime at 18 months, « A » had nocturia until 3 and « B » until 4 years.

Schooling: The twins will start school in September 1957.
Milieu: Always lived in the same environment.

Physical examination

Physeal examination

Differences are more striking than in Set No. 1. « A » displays conspicuous left

Twin set No. 2

« A » Fig. 3 « B »

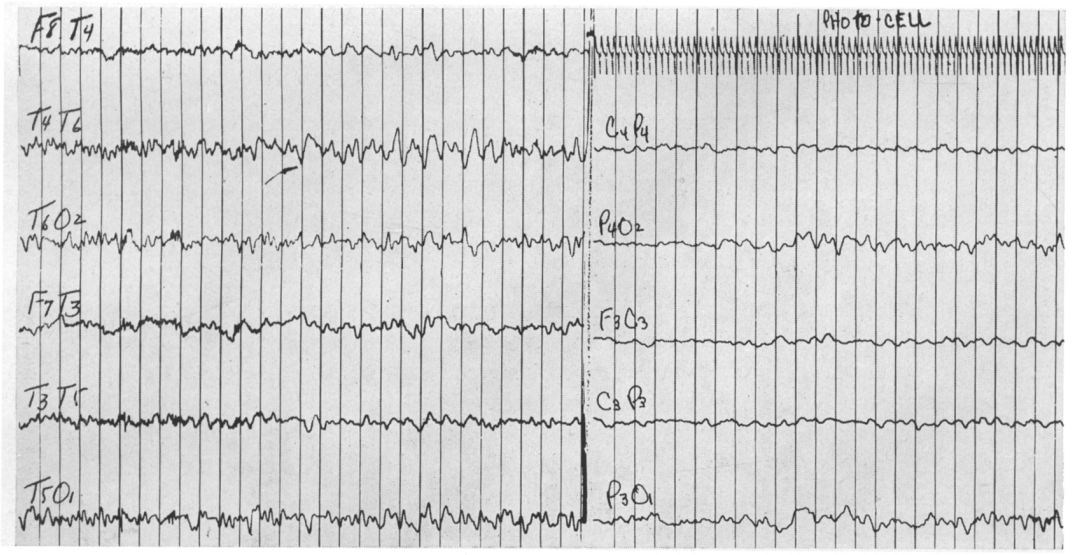

Fig. 4

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asymmetry. The head, of the arrested hydrocephalitic type, measures 20½" in circumference. At present the measurements are equal in both but, in 1953, a difference of 1½" was noted. « A » is shorter than « B » by 1¼" and weighs 3 lbs. less.

The height-calf ratio characterizes slender individuals; the somatotype, slight ectomorphysm.

Postural studies are negative.

« A » shows mild spastic left hemiparesis. The circumference of his left leg is 6/8" less than on the right. The motor tests established more differences than in Set No. 1.

« A » does not always rely on his left upper extremity for bilateral activities or as an ancillary. However, steady progress observed during the past 4 years favours good functional prognosis.

Electroencephalographic studies (Fig. 4).

In both subjects, rhythm is at 8-8.5 c/sec.
The background rhythm at rest in such that the tracing of one cannot be distinguished from the other.

« A » shows:

1. Right fronto-central asymmetry.
2. Epileptiform discharges over the rigt fronto-central and mid-temporal regions.

« B »: No pathological findings.

Treatment

No formal therapeutics. Yearly check-ups are recommended.

Psychological studies

Intellectual levels: The Terman showed a difference of 20, and of 28 in Goodenough, in favour of « B ».

Handedness: In drawings, both are right-handed.

Personality free test: The twins are deeply involved in the Oedipus Complex. However, « A » appears more realistic and should find better solutions to problems than his twin, who greatly intellectualizes this phase of development. This trend may be due to intellectual factors strengthening the super-ego forces. In « A » the Machover and Self tests point out central organic pathology, responsible for hostility and projection of the physical handicap. In the projective tests, « B » shows maternal identification; and diminished efficiency at action level.

The super-ego is over developed in both, indicating good motivation. « A » lacks self-confidence and attention, whereas « B » shows a high spirit of competition, claiming that his performances and results supersede by far those of his brother.

The father demonstrated deep interest and understanding towards « A »; this is associated with efforts to increase self-confidence.

The mother, unconsciously over-emphasized discrepancies and, by the same token, increases the assurance and self-confidence of « B ». Thus, she diminishes the self-confidence of « A ».

Consequently, « B » strongly identifies himself with her. This may explain why he sought maternal attention longer than his brother, through enuresis.

Psychiatric findings

« A » and « B » show physical resemblance and get along very well. Both, as learned through direct questioning, and contrary to the findings of projective tests, identify themselves with their father, though, in « A », this is stronger.

Intellectually: « B » is more alert, faster, boisterous about scholastic achievements. During classes he raises his hand even if ignorant of the answer. His peech is more spontaneous and louder. « A » is slower but less superficial. He talks timidly in a neutral tone and self-effacing voice.

Emotionally: « A » is timid, more affectionate, masochistic and somewhat depressed. He likes his younger sister better than his twin brother does.

« B » is more irritable and, when crying, difficult to appease. Self-asserting, aggressive, competitive, he cannot tolerate to be outdone and takes every opportunity to interrupt his brother.

In action: « B » always *gets there first*; never plays alone and, though faster, is restless and tires more easily of any activity. Since he shows himself to advantage, he attracts more attention and consequently his relationships are more diversified.

« A » is slower but more persistent. He completes his brother's unfinished tasks, and is more cooperative and helpful at home. His play is less varied but shows more depth. He identifies himself more strongly with his father who has great mechanical ability. However, he lacks self-confidence and when « B » is more advanced in a project, becomes nervous, worried and contracted. In the past year he has shown more behaviour changes than his brother; for instance, he is becoming more aggressive, imitates « B » less and does not always yield to him. Since he cannot easily follow his brother, he plays alone more and is less sociable.

The Parents: (History of Acceptance)

It is worthy of notice that during individual or combined interviews, the opinions of the parents are almost always identical; obviously, the problem has been discussed at length.

Differences are hard to accept, more so if difference has a connotation of superiority. This results in a constant wish to reestablish balance, which may be expressed by: « B » is better than « A », but « A » is better than « B ». Both entities being equally difficult to admit.

The parents admit dissimilarities, but dread that they may increase, since the *superior* will tend to assert himself gradually over the *inferior*, thus creating an inferiority complex responsible for more discrepancies in a vicious circle.

Twin set No. 3

« A » Fig. 5 « B »

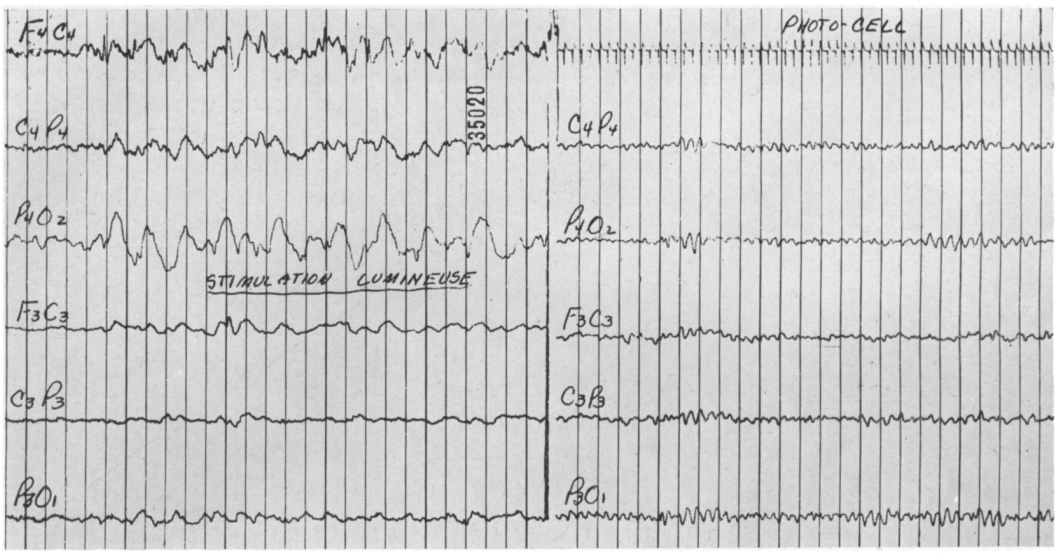

Fig. 6

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Fig. 7 - Twins and cerebral palsy (a combined study)

	Twin No. 1		Twin No. 2		Twin No. 3	
	(A)	(B)	(A)	(B)	(A)	(B)
Age	8 yrs. 9 mos.		6 yrs. 2 mos		18 yrs. 10 mos.	
Sex	F		M		F	
Delivery premature	Yes		Yes		?	
First Born	Yes	No	Yes	No	?	
Weight (Birth)	3 lbs. 4 oz.	3 lbs. 8 oz.	5 lbs. 7 oz.	4 lbs. 8 oz.	?	
Complication	Prolapse of cord		None		None	
Etiology: Postnatal	No	—	No	—	Yes	—
Gross Motor develop. N.	Yes		Yes		Yes	
Holds Head at...	5 mos.		?		?	
Sits at...	7 mos.		?		?	
Walks at...	15 mos	13 mos.	1 yr.		?	
Eats alone	16 mos.		2 yrs.		?	
Toilet Trained	2 yrs.		3 yrs.	4 yrs.	?	
School	3rd gr.		not yet		4th gr	12 th gr.
Identical Appearance %	90%		80%		40%	
Face Symmetrical	No	Yes	No	Yes	**No**	Yes
Hair color	blond		light brown		brown	
Iris color	brown & green		blue		brown	
Body & Limbs symm.	No	Yes	No	Yes	No	Yes
Body Weight	$49^{3}/_{4}$ lbs.	52½ lbs.	42½ lbs.	45½ lbs.	143½ lbs.	149½ lbs.
Body Height	49 6/8″	50 6/8″	44½″	453/4″	59 5/8″	63½
Calf circumference	n.s. 9″	91/8″	$8^{6}/_{8}$″	9″	15½″	13½″
Height/calf ratio	5.52	5.56	5.2	5.08	3.84	4.7
Rank	extr. slender		slender		stocky	
Somatotype	+++ectomorphy+++		+ectomorphy+		+++endomorphy++	
Posture normal	Yes		Yes		No	**Yes**
	R | L	R | L	R | L	R | L	R | L	R | L
Pathological findings	Yes	No	Yes	No	No	No
	No | Yes	No	No | Yes	No	Yes | No	No
Contracture	No	No	No	No	Yes	No
Atrophy	No | Yes	No	No | Yes	No	Yes | No	No
Strength diminished	No | Yes	No	No | Yes	No	Yes | No	No
Oculo-motor dysf.	No	No	No	No	No	No
Sensory dysf.	No	No	No	No	No	No
Epileptic seizures	No	No	No	No	Yes	No
Use of U.E.	Yes	Yes	Yes	Yes	No | Yes	Yes
Dexterity of U.E. normal	Yes	Yes	Yes	Yes	No | Yes	Yes
Handedness	Yes | No	No | Yes	Yes | No	Yes | No	No | Yes	Yes | No
Use of L.E. normal	Yes | No	Yes	Yes | No	Yes	No | Yes	Yes
Brace for L.E.	No	No	No	No	Yes | No	No
E.E.G. Normal	No	Yes	No	Yes	No	Yes
Treated	No		No		Yes	No

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Fig. 8 - Psychological Findings

		I.Q.				Handedness		Free drawing	Findings from projective tests									Findings from interviews: Patients									Findings from interviews: Parents		
		AGE	GOODENOUGH	TERMAN	BPINARD	R	L	Content	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
♀ Twin 1	A	8.9	68	95	×	×	×	Rabbitt		×			×					×	×	×						×	×		F
	B		83	101	×		×	Moon										×	×	×	×						×		M
♂ Twin 2	A	6.2	93	86	×			3 men	×	×	×			×	×							×		×	×		×		M
	B		131	106	×	×	×	3 squares			×	×	×			×							×				×		F
♀ Twin 3	A	18.10	44	×	43		×	Strange cat	×	×			×		×		×			×						×			F
	B		100	×	108	×		House & landscape						×	×		×			×									M

LEGEND:

1. Organic cerebral disease
2. Handicap shown
3. Oedipus complex unsolved
4. Maternal figure
5. Maternal identification
6. Paternal identification
7. Hostility (Signs)
8. Strong superego
9. Obsessive
10. Lack of tact
11. Nervousness
12. Docility
13. Tics
14. Inferiority
15. Superiority
16. Unadapted
17. Father more active in rehabilitation
18. Mother more active in rehabilitation
19. Father calmer
20. Mother calmer
21. More attachment

M.: Mother
F.: Father

For the grandparents, differences mean: *less bright*, consequently, willingly or not, through education, the parents cannot but partake, at least unconsciously, in this opinion.

TWIN SET No. 3.

Sex: Female.
Present age: 18 years and 10 months.
Motor development: Normal.
Etiology: At 5, « B » suffered an acute encephalopathy chiefly involving the left temporo-parietal lobes. Although a left occipital trepanation and left temporal craniotomy with subtemporal decompression were performed, the etiology was never ascertained. Between 1943 and 1953 she was hospitalized on three occasions and attended out-door clinics for a right spastic hemiparesis, *grand mal* and Bravais-Jacksonian type of seizures. Because of the parents' lack of interest, the seizures were never adequately controlled. However, surgical leng thening of the plantar flexors was done with good results.
Schooling: « A » left school in 1952 after grade 4. « B » is presently in grade 12.
Milieu: The sisters have lived separately for the past 12 years.

Physical examination

Similarities were more difficult to evaluate than differences. Faces, in spite of different expressions, are alike; colour of hair and iris is the same. There is a notable discrepancy in height and weight: « A » being almost 4" shorter and weighing 6 lbs. less. However, the same somatotype was found: « B » is of moderate and « A » is of strong endomorphysm, based on the height-calf ratio, characterizing both as stocky individuals.

Postural studies were normal in « B » but « A » has the typical attitude and gait of the spastic hemiparetic, combined with the mentally retarded physiognomy.

Besides the left spastic hemiparesis, there is atrophy of the right upper and lower extremities. « A » is left-handed and makes no use of her right arm.

Electroencephalographic studies (Fig. 6)

The background rhythm is not quite the same; while « B's » is regular and varies between 10-11 c/sec., « A's » is consistently at 10 c/sec., irregular, mixed with slower frequencies and epileptic abnormalities.

These epileptogenic abnormalities were:

1. Localized: electrical silence above the left Sylvius fissure;
2. Diffuse: frequent paroxysmal discharges of epileptic character with slow spike and wave.

Treatment

« A » was admitted for a period of 2 months for evaluation and rehabilitation. A short brace improved her gait and helped correct a persistent equinovarus deformity. However, no improvement was noted at the level of the right upper extremity because of extreme spasticity, associated with fixed hand and wrist flexion contractures.

Psychological studies

Intellectual levels: There is an I.Q. difference of 65 in favour of « B », in the Barbeau-Pinard test; results are parallel in the Goodenough.

Handedness: In drawings, « A » is left and « B » is right-handed.

Personality: The free test shows more infantilism in « A » than « B », « B »'s drawing was of superior artistic value compared to the average adolescent.

In the Machover and Self tests, the projected handicap of « A » is portrayed in a fantasmagoric construction: evidence of intra-cranial disorder. The Self test leads us to believe that « A » functions at a mental deficiency level. « B » shows a slight hostility, some rigidity and masculine identification. This was confirmed at interviews with the father.

Personality components: These appeared similar in both, but particularly when seen separately. Both are equally docile and cooperative; while « A » speaks slowly and sparingly, « B » talks in a lively fashion. As demonstrated in their drawings, the adolescents are very obsessive.

Psychiatric findings

Here again the twins have consonant names. They used to dress identically, development was parallel and they were equally active. After the onset of cerebral palsy, « B » expressed wishful thinking to the effect that « A » might eventually catch up to her. There still seems to be a deep mutual affection, which is more infantile and possessive in « A ».

According to the parents, slight differences pre-existed the cerebral damage, yet these are accentuated retrospectively. For instance, the parents state that the twins never resembled each other, and add that « B » was blonde while « A » brunette, although this was not confirmed at examination.

It took longer to establish continence in « A », who was more shy and cried more easily.

Following « A's » disease, differences may be classified in three areas:

a) Physically: « B » is good-looking; « A » is not.

b) Intellectually: « B » is normal, communicates verbally with ease, though her opinions are stereotyped. « A », on the contrary, is severely retarded, has no spontaneity, does not wish to communicate verbally, and her thinking is poor in content.

c) Emotionally: Differences are more marked. « B » is an extrovert with whom contact is easily established. She has good control of her emotions. Clinically, she

was assessed as feminine and maternal whereas masculine identification was revealed by the projective tests. Her main mental mechanism of defence is reaction formation; she insists that she gets along well with everybody. She is optimistic towards her twin: « Things will be alright », she states. During holidays she cares for her sister and shares the same bed, because: « she likes it so much! ».

« A » is sensitive and shows considerable lack of security. She longs for friendship, but her attitude discourages any overtures; she is resentful, negativistic and pessimistic. She has quick outbursts of aggressiveness and is easily annoyed and grumpy.

In Action: « B » wishes to devote herself to teaching, places herself at her sister's level, and in all, has a *goodie-goodie* attitude.

« A » has no energy and no goal in life. Her best method of obtaining her ends is through complaining and whining.

The Parents: (History of Rejection)

By their attitude, the parents do not stress similarities but emphasize differences, even those prior to illness.

Both call the daughters by nickname: for « B », they use a flattering contraction of her name but for « A », one that is derogatory and refers to her unshapely physique.

At the moment of the patient's illness, the mother postponed hospitalization, justifying her attitude thus: « she was nearly gone ».

The mother has a depressive personality with compulsive traits, is meticulous and exacting, cold toward « B » and rejecting towards « A ». She is pessimistic, and agrees to examination with the hope that it may hasten internment. Though rejecting, she pays more attention to « A », always criticizing, discouraging and making her lose her patience and then accusing her of ill-temper when answered back. She denies her daughter all liberty of action. She is self-justified, her feelings being: « always what they should be ». She attributes to the normal twin warmest feelings towards her sister.

Medical conclusions

1. The goal of rehabilitation is to adapt the individual to an abnormal physical state through the application of all possible means; difficulties being proportionate to the handicap and its permanency, this applies in particular to the cerebral palsied.

2. Therough investigation brings forward adaptation problems which, if unrecognized or unsolved, will become aggravated, as demonstrate by H. Wortis in a recent study.

3. In monozygotic twins, identical hereditary factors may be modified by certain pathological conditions with consequent motor impairment.

4. The same somatotype was found constant in each set, in spite of apparent physical discrepancies.

5. Though one case only presented seizures, the electroencephalograms demonstrated epileptic potentialities in each of the three cerebral palsied children.

6. Because the etiology was in no way related to the parents, the prognosis for future pregnancies of the mother was favourable.

7. The consequences of cerebral palsy upon the individual, particularly in benign forms, are not always easily ascertained. The conclusions concerning the policy to follow cannot be easily formulated.

8. The present study made possible the total investigation of three pairs of twins, including their environment. Indeed, although the results of the investigation have projected the superiority of the normal child, the global handicap of the affected one can be assessed with much greater degree of accuracy by the use of the co-twin method.

9. The co-twin method has produced results of important diagnostic and prognostic value.

10. In future, personal experiences, which are difficult to relate, will allow more exactitude in the appreciation of rehabilitation components among the cerebral palsied.

Psychological conclusion

1. There is a constant discrepancy in the I.Q.'s, in favour of the normal twin, related to the somato-cerebral structure, whereas a constant similtude exists in personality functioning.

2. Fundamental traits remain the same at different levels of intelligence but the pattern of expressions differs. This appears to be related with the Oedipus Complex and parental inter-relations, also with the identification process to parent of opposite sex. Nurture seems more important here than nature. In fact, structural factors of personality seem less affected and more similar than structural factors of intelligence.

3. The normal twins have a tendency to identify themselves more with the parent of opposite sex; this identification is more evident in twins who are at the Oedipus Complex age.

4. The projective tests demonstrate the intellectual level of the normal twins more accurately than in the case of the cerebral palsied children; but the same tests were more reliable to detect personality changes in the C.P. cases.

Psychiatric conclusion

It is normal to meet with sibling rivalry for the affection of the parents who feel a natural and necessary preference for the last born. Parents can usually make temselves believe that they love their children equally. This belief is strengthened by virtue of the time span between two single births which precludes the risk of disfavourable comparison between the children.

The problem is more difficult in the case of twins where comparison is imposed by the very fact that they are of the same age. Then myth of their equal love for

their children is maintained consciously and only at the price of great expense of energy, as illustrated in the meticulous resemblance of manner, dress, play, etc.

The problem becomes more acute when a physical and/or mental defect breaks the resemblance and imposes an unfavourable comparison. This will be dealt with through other mechanisms of defence more or less pathological and harmful to the normal development of two individuals, whom the parents would have liked to treat as one entity: he twins (« our twins »).

Of course, this problem will be resolved differently, governed by the psychological make-up of each parent and the severity of the symptoms. The difference may well be denied if it is not obvious. More so, as in Set No. 1, if the parent (the mother) is meticulous and a perfectionist. To her, physical defects mean *lack of intelligence*, and she will not only deny them but will try to evade the question by emphasizing the neurotic traits in the normal twin. The difficulty of the parents to discuss the problem between themselves also originates from this denial.

The problem is more realistically met by the parents of Set No. 2. Granted, it creates more anxiety, but it is conducive to coordinated action on their part. The difference between the twins is greater and the comparison always results in « *'A' cannot do what ' G ' does* », but balance is regained by the immediate addition of « *But ' A ' is more... (gentle, persevering, etc.) than ' B '* ». The danger here is that, though evaluating the possibilities correctly, the need to establish balance will have a detrimental result on the development of the individual potentialities of the children. This danger was expressed by the mother: « I wonder if we should stimulate ' A ', or restrain ' B ' so that he does not crush his brother ». Here again, they look for *equality in the twins* and not, as it should be, for the development of individual potentialities.

The third possible solution was adopted by the parents of Set No. 3. It is imposed by greater discrepancies, with results very detrimental to the cerebral palsied child.

Unable to deny dissemblance, as in Set No. 1, or to establish a balance, as in Set No. 2, dissemblance is acknowledged and even emphasized later to the point of completely segregating the handicapped child by praising « B » and rejecting « A », which the latter will feel all her life. There is no langer a twin problem.

The problem would not be such if the children were loved for what they are, including their differences, rather than loved for what the parents would like them to be. Normal education calls for bringing up children according to the standards of the parents, of the milieu or culture. However, to reach this goal, the parents should always bear in mind the individual potentialities of the children. This, nevertheless, would mean the appreciation of differences. Unfortunately, the parents hesitate to adopt such an attitude because their sentiments towards the children might differ and they would be afraid of consecutive feelings of guilt.

Summary

A survey conducted at the Rehabilitation Institute of Montreal, covering 250 cases of cerebral palsy, came to include three pairs of identical twins, all discordant as to the disease. Pair I was female, 8 years old; Pair II, male, 6 years old; Pair III, female, 18 years old.

All vere subjected to physiatric, psyschiatric, and psychological tests as well as to tests involving activities of daily living. In each instance, the study was completed by EEG's still and motion pictures. The investigations included psychological and psychiatric evaluation of parents.

Extensive medical, psychological and psychiatric conclusions are drawn.

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RIASSUNTO

Uno studio, eseguito presso l'Istituto di Riabilitazione di Montreal su 250 casi di paralisi infantile, venne a comprendere tre coppie gemellari monozigotiche, tutte discordanti. (Coppia I, femminile, anni 8; coppia II, maschile, anni 6; coppia III, femminile, anni 18).

Tutti furono sottoposti ad esami fisici, psichiatrici e psicologici come anche a tests riguardanti le attività quotidiane. In ogni caso lo studio fu completato da elettroencefalogrammi, foto e cinematografia. Le ricerche furono estese a valutazioni psicologiche e psichiatriche dei genitori.

Si sono raggiunte dettagliate conclusioni mediche, psicologiche e psichiatriche.

RÉSUMÉ

L'étude faite dans l'Institut de Réabilitation de Montréal sur 250 cas de paralysie infantile, comprend trois couples de jumeaux monovitellins, tous discordants. (Couple I, féminin, âgé de 8 ans; couple II, masculin, âgé de 6 ans; couple III, féminin, âgé de 18 ans).

Il ont tous été soumis à des examens psychiques, psychiatriques et psychologiques, de même qu'à des tests sur les activités quotidiennes. Dans chaque cas, l'étude a été complétée par des electroencéphalogrammes, photos et reprises cinématographiques. On a étendu les recherches par des évaluations psychologiques et psychiatriques chez les parents.

On en a tiré des conclusions trés détaillées, tout aussi bien dans le domaine de la médecine, que dans celui de la phychologie et de la psychiatrie.