

A Five to Fifteen Year Follow-up Study of Infantile Psychosis

I. Description of Sample

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The psychoses of infancy have long been a matter for controversy. The nature of the disorders, their aetiology, relationship to adult forms of psychosis, long-term outcome and response to treatment are still areas of disagreement among clinicians. Follow-up studies should provide information relevant to some of these problems. Unfortunately, the findings of published investigations have been contradictory. To a large extent contradictions appear to be related to differences in diagnostic criteria, but the failure of many writers to describe their cases adequately has made it difficult to assess the significance of possible differences.

The problems associated with the wide variation in concepts of child psychosis and in the criteria for its diagnosis have been increased by the tendency of some writers to reject the need for diagnosis or classification (Beres, 1956; Esman, 1960; Rank, 1949; Szurek, 1956). But, as Eisenberg (1966) put it, "differential diagnosis is no academic exercise to satisfy statistical pigeon-holes, it is the very stuff of medicine". He urged that all future clinical reports should include precise specification of criteria (Eisenberg, 1957). The need for this was as evident in a recent review of the literature (Rutter, 1967) as it was in Eisenberg's review in 1957.

The first report in 1961 of the British working party on the "schizophrenic syndrome in childhood", under the chairmanship of Dr. Mildred Creak, constituted a most important step towards the goal of general agreement among psychiatrists and psychologists on the necessary diagnostic criteria for child psychosis (Creak *et al.*, 1961). The 'nine diagnostic points' put forward by the working party were valuable in highlighting the phenomenology of child psychosis and in arousing interest in accurate diagnosis. Inevitably, there were ambiguities and

inconsistencies in this first formulation of diagnostic criteria (Rutter, 1967), and a further progress report of the working party in 1964 (Creak *et al.*, 1964) showed that some of the points had been interpreted in rather divergent ways by different clinicians. It is not yet possible to use the 'nine points' as a sufficient description of cases. Accordingly, the present paper, the first of a series reporting a five to fifteen year follow-up study of children with infantile psychosis, attempts to provide a fairly detailed description of the children and their disorders so that comparisons with other series may be possible.

METHOD

The records of the Maudsley Hospital Children's Department from 1950 to 1958, inclusive, were searched in order to select all children seen before the onset of any signs of pubescence, for whom an unequivocal diagnosis of child psychosis, schizophrenic syndrome of childhood, infantile autism, or any synonyms of these had been agreed by all Maudsley Hospital consultant psychiatrists who had seen the child. In searching for cases, the diagnosis coded on the front sheet of the records of all children attending the Department and the symptoms coded on a more detailed item sheet were used.

Sixty-three psychotic children fulfilling these criteria were identified, and for each child another child of the same sex, first attending the same Department within one year of the first attendance of the psychotic child and matching the psychotic child as closely as possible in age and measured intelligence, was selected as a control. Psychologists routinely administer an intelligence test to all children attending the Department, and at the time of the study 93 per cent. of the children were in fact tested. Those

not tested usually had a recent test result from the referring clinic or hospital. For each child a card, which includes details of age, IQ, and sex, is punched, and a mechanical sort of these cards was used to locate the control children. The records of the children were then examined so that children showing 'psychotic traits' or 'some psychotic features' could be excluded from both the psychotic group and the control group. This, together with the demand that there be unanimous agreement on diagnosis, resulted in the exclusion of many children who had been confidently diagnosed as psychotic by other psychiatrists, but it seemed preferable to obtain a group of children for whom there was no diagnostic doubt. The records of one additional child were found only after the study was well advanced. He was followed-up, but is excluded from all psychotic-control comparisons. The records of three possibly psychotic children could not be found.

Ideally, in matching for IQ, each pair of psychotic and control children should have been tested on the same intelligence scale, but this proved to be an impracticable demand. The tests used are shown in Table I. The most commonly used test in the psychotic group was the Merrill-Palmer; this was also used with many of the control children, but more were tested on the Binet, a test only infrequently employed with the psychotic children. The children's IQs were not converted to standard scores because some of the tests do not have known means and standard deviations and be-

cause some of the IQs were extrapolated from scores on only a few subtests from the intelligence scale (as the children had not co-operated on the full test). Scores on the Vineland Social Maturity Scale were taken as equivalent to scores on intelligence tests. Thus the IQs must be regarded as rough approximations. Nevertheless, actual scores were used, and no account was taken of the psychologist's judgment that the child was really more (or less) intelligent than the score suggested. As will be shown in a later paper, in spite of these drawbacks and in spite of the frequent comments by the testing psychologist that the scores were unreliable or did not provide a valid measure of the child's abilities, the scores proved to be remarkably stable and also excellent predictors of the child's social and intellectual functioning five to fifteen years later.

Table II shows the age, sex, and IQ of the psychotic and control children. Close matching was possible, and there was no significant difference between the means or distribution of ages or IQs in the two groups. There were 49 pairs of the 63 in which the intra-pair age difference was less than twelve months, and in 30 of these the difference was six months or less; in no cases was the difference as much as two years. In 47 of the pairs the matching for IQ was within 10 points of IQ. Actual scores were available for 53 of the psychotic children and 58 of the controls. One of the psychotic children and three of the control children scored below the floor of the test on which they were matched and therefore did not receive an exact IQ. For the the purposes of matching they were given the basal score on the test. Ten of the psychotic children and two of the control children did not have a score on the Vineland Social Maturity Scale and were completely untestable on any intelligence test. Examination of the findings on the untestable children who had received a Vineland score suggested that it could be assumed that untestable children had an IQ of below 50. Therefore, for the purpose of matching children on IQ this assumption was made when no score of any kind was available.

The control children were selected solely on the basis of age, sex, IQ and absence of any diagnosis involving terms such as 'with psychotic features'. Apart from this exclusion, no attempt

TABLE I
Tests Used in Matching Psychotic and Control Children

Test	Psychotic Group	Control Group
Merrill-Palmer	25	16
Binet	8	28
WISC Full Scale	4	10
WISC Verbal Scale	—	1
WISC Performance Scale	3	1
Leiter	3	1
Goodenough Draw-a-Man	1	—
Vineland	9	4
Untestable	10	2
Total	63	63

TABLE II
Age, Sex and I.Q. of Psychotic and Control Children

Age at first attendance Maudsley Hospital	Psychotic Groups	Control Groups
2 yrs. 9 mo.-3 yrs. 11 mo. ..	10	7
4 yrs.-4 yrs. 11 mo.	14	12
5 yrs.-5 yrs. 11 mo.	10	13
6 yrs.-6 yrs. 11 mo.	12	12
7 yrs.-7 yrs. 11 mo.	8	6
8 yrs.-8 yrs. 11 mo.	3	8
9 yrs.-9 yrs. 11 mo.	4	4
10 yrs.-10 yrs. 8 mo... ..	2	1
Total	63	63
Mean Age	5 years 11 months	6 years 2 months
Sex:		
Boys	51	51
Girls	12	12
Total	63	63
Male/Female ratio.. ..	4.25:1	4.25:1
IQ:		
50 or below	27	28
51-70	18	15
71-90	12	13
91-120	6	7
Mean IQ of those testable ..	62.49	60.36
Total Number Testable ..	53	58

was made to select children with any particular psychiatric disorder, and inevitably the group chosen was clinically heterogeneous. The majority (38) of the control children had some degree of mental subnormality, and very frequently retardation of speech was one of the chief complaints. At least a third had probable organic disease of the brain, and many (9) were epileptic when first seen at the hospital. Behaviourally, a third (23) presented with disorders involving socially disapproved or antisocial conduct, a quarter (15) had neurotic disorders, a few (6) showed the hyperkinetic syndrome, 8 had uncomplicated mental subnormality, and the remainder (11) had other disorders (including subacute organic reaction, enuresis and encopresis as isolated disorders, extreme clumsiness, personality disorders, and specific developmental speech disorder). In spite of the exclusion

of children diagnosed as having 'psychotic features', at follow-up, one of the control children was thought to be definitely psychotic and three others probably so.

In the initial selection of the psychotic children, the diagnoses made at the time were utilized; no attempt was made to utilize the authors' own diagnostic concepts. Nearly all the children had been seen at some time by both the late Dr. Kenneth Cameron and Dr. James Anthony. Several other psychiatrists had seen a smaller proportion of the cases, but it may be assumed that Cameron's and Anthony's criteria were most used in making the diagnosis of child psychosis. Cameron (1955 and 1958) employed Potter's criteria (1933) of "withdrawal of interest from the environment; dereistic patterns of thinking, feeling, and action; diminution or defect in emotional rapport; diminution, dis-

tortion or rigidity of affect; variation of mobility either towards increase and hypermobility, or diminution to complete immobility or to bizarre or stereotyped behaviour; finally to regression", which Cameron regarded as equivalent to Despert's description (1938) of "loss of affective contact with reality . . . coincident with or determined by specific phenomena of regression and dissociation". However, as will be shown, the psychotic children differed in many ways from Potter's cases and were similar to only some of Despert's.

Anthony (1958a and b; 1962) has differentiated three types of psychosis: (1) a very early onset group which he equates with Kanner's primary infantile autism, Bender's first age group and Despert's 'no-onset' group, (2) a group in which massive regression takes place between the ages of 3 and 5 years and which includes Heller's disease, Mahler's symbiotic psychosis, Bender's second age group, Despert's 'acute-onset' type and the De Sanctis and Weygandt's dementias, and (3) a group with an onset in the middle and late years of childhood. The last group was necessarily partly eliminated, and in practice completely eliminated, from the present series by the demand that the child should first have attended the clinic before the onset of pubescence. As judged by the age of the child at the onset of the psychosis there were also very few in the second category. The great majority of the children had shown abnormalities from early infancy; thus most of the disorders could be classified with Anthony's first group of early onset psychosis.

RESULTS: DESCRIPTION OF SAMPLE

Sex

There was a marked preponderance of boys among the psychotic children (Table II); the male/female ratio was 4.25:1.

Age of Onset

In over half (54 per cent.) the psychotic group, the first signs of psychotic development had been apparent in early infancy with no preceding period of normal development (Table III). In a quarter (25 per cent.) there was an account of psychosis intervening after a period

of apparently normal development. However, in these cases the designation of normal development depended on normal motor milestones and no history of marked early behavioural or social difficulties, plus, sometimes, an account of the child speaking a few words. None of these children had gained phrase speech, the history of early infancy was often inadequate, and it is probable that in most cases the psychosis had in fact begun earlier but had not been noticed by the parents.

TABLE III
Age of Children at Onset of Psychosis

	Number of Children
<i>Onset in Early Infancy</i> (No period of normal development prior to onset of psychosis)	34
<i>Onset after period of dubiously normal development</i>	16
Onset before 24 months	10
Onset between 24 and 30 months	5
Onset after 30 months	1
<i>Onset after period of reasonably definite normal development</i>	13
Onset before 24 months	1
Onset between 24 and 30 months	8
Onset between 31 and 36 months	1
Onset between 3 and 5 years	2
Onset between 5 and 5½ years	1
Total	63

Nevertheless in a fifth of the cases (21 per cent.) there was a fairly convincing history of normal development before there were any signs of psychosis. In most cases (9) the psychosis began before the age of thirty months, but in two children psychotic development was first apparent between thirty-one and thirty-six months, and in one child development seemed normal up to the age of five years.

Behavioural Characteristics

The behavioural characteristics of the psychotic and control children are shown in Table IV. Fuller descriptions of the behaviour together with case illustrations are given elsewhere

TABLE IV
Behavioural Characteristics of Psychotic and Control Children

Behavioural Characteristics	Psychotic Children	Control Children	Level of Significance
<i>Relationships with people:</i>			
Abnormal relationships with peers ..	63	52	.01
Autism	57	8	.001
Withdrawal	21	12	N.S.
<i>Speech:</i>			
Retarded development (either through delay or regression)	63	53	.01
No speech at 5 years	32	7	.001
Ever thought deaf	22	7	.01
Excessive response to sounds	12	2	.025
Echolalia	29*	19*	N.S.
Pronominal reversal	19*	8*	.001
<i>Ritualistic and compulsive phenomena:</i>			
Abnormal attachments	26	12	.025
Abnormal preoccupations	37	9	.001
Non-adaptability (resistance to change)	37	10	.001
Other 'obsessional' phenomena	32	8	.001
Any of the above 4 items	57	34	.001
Any of the above 4 items in marked degree	39	8	.001
At least 3 of the 4 items	23	4	.001
<i>Motor Phenomena:</i>			
Hyperkinesis	31	27	N.S.
Hypokinesis (at first attendance)	10	2	.05
Stereotyped repetitive movements (all kinds)	49	21	.001
whole body (other than rocking)	27	5	.001
hand and finger mannerisms	19	4	.01
face, head and neck movements	21	13	N.S.
<i>Poor concentration:</i>			
Short attention span/poor persistence (at follow-up)	35	17	.01
Increased distractibility (at follow-up)	2	12	.01
<i>Self-injury</i>	23	10	.025
<i>Lack of response to painful stimuli</i>	10	4	N.S.
<i>Other Behavioural Problems:</i>			
Feeding difficulties	23	15	N.S.
Sleeping difficulties	23	20	N.S.
Anxiety and fears	40	39	N.S.
Enuresis (after age 4 years)	44	34	N.S.
Encopresis (after age 4 years)	37	19	.01
Aggression	27	26	N.S.
Temper tantrums	49	45	N.S.
Total number of children	63	63	

* Comparison based on proportion of children with useful speech who showed the characteristic.

(Rutter, 1966). The characteristics chosen for study were those regarded by other writers as indicating psychosis, together with a sample of some of the common behavioural disturbances

associated with non-psychotic disorders. There were marked differences in the behaviour of the psychotic and control children (22 of the 34 comparisons provided differences which were

statistically significant at the 5 per cent. level or better), but to a large extent the differences lay in the patterning and severity of disorder. No symptom or sign occurred solely in the psychotic children, and only two items (abnormal relationship with other children and retarded development of speech) occurred in all the psychotic children. The value for differential diagnosis of both items was severely limited by the finding that both were also present in the majority of the control children (although the difference between the frequencies in the psychotic and control groups was statistically significant).

(i) *Relationships with People*

Disturbed interpersonal relationships were found with nearly all the children in both groups although they were slightly, but significantly commoner ($p < .01$) with the psychotic children. What was much more characteristic of the psychotic children was the nature of the disturbance in relationships. Whereas most of the psychotic children (57) showed 'autism', only a few (8) of the control children exhibited this characteristic. In fact all the psychotic children had been described as 'autistic' at some time, but here the term is used in the more restricted sense as applying to children who appeared markedly aloof and distant, who showed an apparent lack of interest in people, usually manifest by persistent avoidance of eye to eye gaze, who showed little variation in facial expression, rarely exhibited their feelings or appreciated humour and who failed to show sympathy or empathy for other people. Actual physical withdrawal from other people occurred in nearly a third of the psychotic children at some time, but the incidence of withdrawal was not significantly greater than in the control group.

(ii) *Speech*

Retarded development of speech (shown either by delayed development from the beginning or by regression of speech development) was characteristic of the children in both groups, although it was slightly and significantly more frequent in the psychotic group. However, the abnormalities in communication were much more persistent in psychotic children; half (32)

were still without speech at five years compared with only a ninth (7) of the control group. A marked lack of response to sounds was particularly characteristic of psychotic children; over one-third (22) had been thought deaf at some time compared with only one-ninth (7) of the control children. Paradoxically, although much less common, distress in relation to sounds was also significantly more frequent among the psychotic children. Echolalia occurred in over three-quarters of the speaking psychotic children, a rate twice that in the control group. Pronominal reversal, usually forming part of a more general echoing tendency, was also significantly commoner among the psychotics.

(iii) *Ritualistic and Compulsive Phenomena*

Stereotyped activities, apparently ritualistic and compulsive in nature, often complex, and usually followed by distress if the child was prevented from carrying out the behaviour, were considerably and significantly commoner among the psychotic children. These activities were subdivided into four categories (abnormal attachments, abnormal preoccupations, non-adaptability or resistance to change, and other obsessive phenomena). Of the psychotic children, 39 showed at least one of the items in marked degree compared with 8 of the control group, and 23 psychotic children exhibited at least three of the four items compared with only 4 control children.

(iv) *Motor Phenomena*

Although marked overactivity occurred in nearly half the psychotic group it was equally common in the control group. Hypokinesia was much less frequent in both groups, but it was significantly commoner among the psychotic children than among the control children. Stereotyped repetitive movements were exhibited by twice as many psychotic as control children. Two types of stereotyped repetitive movements were particularly associated with psychosis—complex whole body movements (other than rocking) and hand and finger mannerisms.

(v) *Concentration*

Significantly more psychotic children showed

a short attention span or poor persistence when given tasks or activities to perform, but significantly fewer had increased distractibility. Whereas among the control children, short attention span and *increased* distractibility tended to be associated, among the psychotic children short attention span was frequently associated with *decreased* distractibility.

(vi) *Self-injury*

Over twice as many psychotic children as control children injured themselves; biting of the wrist or the back of the hand, and head banging were much the commonest forms of self-injury.

(vii) *Common Behaviour Problems*

Feeding and sleeping problems, anxiety and fears, enuresis, aggression and temper tantrums were all common among psychotic children, but these problems were equally common among the control children. Encopresis after the child's fourth birthday was significantly commoner in the psychotic group.

Cognitive Characteristics

Extreme variability in intellectual functioning was commoner in the psychotic group than in the control group (see Rutter, 1966 for details) and the variability generally followed the same pattern. The psychotic child was often untestable on verbal tasks, and when testable was at his worst on those demanding abstract thought or symbolism or sequential logic. He was at his best on tasks requiring manipulative or visuo-spatial skills, or, among verbal tests, on those requiring only immediate memory. The variability in intellectual functioning (so-called "islets of intelligence") was significantly commoner among children with continuing retardation of speech and appeared to be due to defects in the child's use and understanding of language.

Ordinal Positions and Family Size

The psychotic children came from somewhat smaller families than the control children (mean sibship size of 2.37 compared with 2.87), and in association with this there was a non-significant excess of only children among the psychotics. However, in both groups there was a

TABLE V
Ordinal Position of Psychotic and Control Children

Ordinal Position	Psychotic Group	Control Group
Eldest	25	27
Youngest	14	14
Only	13	7
Other	11	15
Mean size of sibship ..	2.37	2.87

significant excess of eldest children over youngest children (in a normal population the number of eldest and youngest children will necessarily be equal). When the position of the psychotic child in the sibship is re-examined in relation to the size of the sibship (Table VI), the issue appears more complicated. While there was an excess of first born (i.e. oldest) psychotic children in two-child families this was not found in larger families. In contrast, the excess of first-born control children was only found in the larger families (Table VII). The explanation for these findings remains obscure.

TABLE VI
Position in Sibship of Psychotic Children According to Size of Sibship

Position in Sibship	Size of Sibship				Total
	1	2	3	4+	
1	13	18	6	1	38
2		9	6	1	16
3			4	2	6
4 or more				3	3
Total	13	27	16	7	63

TABLE VII
Position in Sibship of Control Children According to Size of Sibship

Position in Sibship	Size of Sibship				Total
	1	2	3	4+	
1	7	9	12	6	34
2		12	7	3	22
3			1	5	6
4 or more				1	1
Total	7	21	20	15	63

Social Class

The distribution of social class (judged by the occupation of the head of the household on the Registrar-General's classification) in the control group was close to that in the general population of Greater London, but there was a significant excess of social class I and a significant deficiency of social classes IV and V in the psychotic group (Table VIII).

There was a tendency (which fell just short of the 5 per cent. level of significance) for a greater proportion of the control children to be living otherwise than with their two natural parents (i.e. to have a 'broken home'). There are no comparable figures for the general population of Greater London. However, the figure (13.9 per cent.) for 9- and 10-year-old children in the Isle of Wight (Rutter *et al.*, 1966) is similar to that for the psychotic group. In so far as the differences have any significance, it is probable that there is more of an excess of 'broken homes' in the control group than there is a deficiency in the psychotic group.

Psychiatric Disorder in Parents and Sibs

Eleven parents in the psychotic group and thirteen in the control group had been under

psychiatric care at some time in adult life, mostly for affective or neurotic disorders (Table IX). There was a suggestion that obsessional and phobic symptoms might have been somewhat commoner among the parents of psychotic children. None of the parents in the psychotic group had had schizophrenia.

Twice as many sibs in the control group had received psychiatric care, but the difference between the two groups fell short of statistical significance. The difference was largely accounted for by the higher rate of mental subnormality among the sibs of the control children (7 children compared with one in the psychotic group). None of the sibs of the psychotic children had received the diagnosis of psychosis, schizophrenia or autism. However, a sister of one of the children had had a disorder which had been termed 'possibly autistic'. She was an intelligent girl who had been delayed in her speech development, failed to show affection or form adequate relationships, and had a variety of obsessive manifestations in early childhood. However, unlike her brother's, the developmental difficulties proved to be transient. When seen at the age of 9 years she was a somewhat unusual personality, but appeared quite normal and certainly could not be termed psychotic or

TABLE VIII
Social Class (Registrar-General's Classification)

Social Class	Psychotics		Controls		General Population (Greater London) Heads of Households (1951)
	N	% of known	N	% of known	%
I	15	(23.8)	7	(11.3)	(4.6)
II	20	(31.7)	13	(21.0)	(18.9)
III	26	(41.3)	26	(42.0)	(52.8)
IV and V	2	(3.2)	16	(25.8)	(23.7)
Not known	—		1		
Total	63		63		
Proportion NOT living with their two natural parents					
	Psychotics		Controls		General Population (Isle of Wight)
Not living with two natural parents	6	(9.4%)	14	(22.2%)	(13.9%)
Total	63		63		147

TABLE IX
Psychiatric Disorder in Immediate Family

	Psychotic Group	Control Group
Parents who had received psychiatric treatment ..	11	13
Diagnoses:		
Schizophrenia	—	1
Psychopathy	—	1
Suicide	—	1
Anxiety/depressive neurosis ..	6	9
Phobic state	2	—
Obsessional illness	1	—
Other	2	1
Sibs who had received psychiatric treatment ..	6 (7.1%)	16 (13.0%)
Diagnosis:		
Mental subnormality	1	7
Neurotic disorder	2	5
Antisocial disorder	2	4
?Autistic	1	—
Total No. sibs	85	123

autistic. In addition, there was another child (a brother of one of the psychotic children) with a somewhat similar, although less abnormal, history, but who had not been under any psychiatric care. Both these sibs may have had a much milder disorder similar in type to that shown by their psychotic brothers. If both cases are included (and this involves a considerable stretching of the diagnostic criteria) the rate of psychosis in the sibs is still only 2.4 per cent.

'Brain Damage'

As no generally accepted criteria for 'brain damage' exist, as many proven cases of organic brain disease in childhood are unassociated with abnormalities on clinical examination of the central nervous system, and as the interpretation of findings on special tests (especially the EEG) in young children is very problematical, no precise figure can be given for the rate of 'brain damage' in this group of psychotic children. None of the children showed unequivocal abnormalities on a neurological examination when they first attended the hospital, and in only two children was there satisfactory evidence of organic brain disorder at that time. One boy had first shown signs of psychosis in infancy

after an attack of meningitis at 8 months which was succeeded by the development of epilepsy. Another child also had had fits since infancy, although the psychosis appeared unrelated to any physical illness. In a further three children evidence of probable brain disease became available within a short time after first attendance at hospital. One boy was shown to have congenital syphilis with probable neural involvement, and another boy developed lead encephalopathy; the lead poisoning probably, but not definitely, preceded the onset of psychosis. A girl who had had fits only up to the age of 4 years was found to have possible cortical atrophy on pneumo-encephalography.

If evidence obtained at any period up to the time the child was seen for follow-up in adolescence or early adult life is taken into account, then a larger proportion of children may be considered as probably having some form of 'brain damage' (Table X). A strong likelihood of 'brain damage' existed in 12 children—the first two children noted above and 10 others who developed epileptic fits for the first time long after the onset of the psychosis, usually in early adolescence. In 3 children the onset of fits was associated with general regression but especially in speech. However, none of the children could be shown to have any recognized neurological disorder, although one child was found to have lead poisoning. In this boy the fits may have been due to lead intoxication caused by the pica associated with the psychosis, but at least in the others it appeared more probable that both the fits and the psychosis were due to some underlying brain pathology. Necessarily, this remains a matter for speculation rather than a proven aetiological factor.

A further 6 children probably had 'brain damage'. These included the 3 children already mentioned plus 3 others, of whom one was shown to have retinal (and probably neural) toxoplasmosis and two had persistent spike foci on electroencephalography. Another 16 children had less satisfactory evidence of brain disorder, such as uncertain abnormalities on neurological examination or on an EEG. These children may have had 'brain damage', but the evidence was no more than suggestive and its significance might reasonably be questioned.

TABLE X
Presence of 'Brain Damage' in Psychotic Children

Strong Likelihood	12	1	epilepsy from infancy
		1	meningitis in infancy followed by onset of epilepsy
		10	onset of epilepsy long after development of psychosis
Probable	6	1	toxoplasmosis
		1	neuroleues
		1	lead encephalopathy developing shortly after onset of psychosis
		2	spike focus on EEG
		1	fits in pre-school period only + possible cortical atrophy on AEG
Possible	16	4	uncertain abnormalities on neurological examination
		7	various abnormalities on EEG
		2	marked skull asymmetry
		2	dubious fits
		1	slight enlargement of temporal horn on AEG
No evidence of brain damage:	29		

About half the group (29) showed no evidence of 'brain damage', unless perceptual defects or speech abnormalities are taken into account. However, these speech and perceptual disorders

may have been due to developmental delays in brain maturation rather than to brain disease. Thus, in just over a quarter of the children (18 out of 63) there was evidence suggesting the probability of some organic brain disorder.

Behavioural Characteristics and IQ

Although the range of intelligence among the psychotic children was very great, the differences in intellect were associated with relatively few differences in behavioural characteristics. Compared with those of IQ 60 or above, more psychotic children with an IQ of 59 or less exhibited stereotyped repetitive movements and more were inclined to injure themselves. The retardation of speech found in all the psychotic children tended to be more profound in those who were also mentally subnormal, so that more children with an IQ below 60 were without useful speech when they first attended the Maudsley Hospital. There was also a nearly significant (critical ratio = 1.90) tendency for hyperkinesis to be more common among the psychotic children of low IQ. On the other hand, the intelligent and the mentally subnormal psychotic children were equally likely to exhibit autism, physical withdrawal, pronominal reversal, echo-

TABLE XI
Behavioural Characteristics and IQ in Psychotic Children

Behavioural Characteristic	IQ				Significance
	below 60		60 or above		
	No.	%	No.	%	
Autism	32	(97)	25	(83)	N.S.
Physical withdrawal	10	(30)	11	(37)	N.S.
No speech (at first attendance)	22	(67)	11	(37)	.05
Pronominal reversal	8	(62)*	11	(46)*	N.S.
Echolalia	12	(92)*	17	(71)*	N.S.
Lack of response to sounds	13	(39)	9	(31)†	N.S.
Ritualistic and compulsive phenomena:					
any	31	(94)	26	(87)	N.S.
abnormal attachments	16	(48)	10	(33)	N.S.
abnormal preoccupations	19	(58)	18	(60)	N.S.
non-adaptability	20	(61)	17	(57)	N.S.
obsessive phenomena	12	(36)	20	(67)	.05
Hyperkinesis	20	(61)	11	(37)	.06
Hypokinesis	6	(18)	4	(13)	N.S.
Stereotyped repetitive movements	30	(91)	19	(63)	.025
Self-injury	17	(52)	6	(20)	.025
Total number	33		30		

* Proportion based on children with useful speech. † Excluding one child thought to have organic deafness.

lalia, profound lack of response to sounds, hypokinesia, and ritualistic and compulsive phenomena. The content of the symptoms was, of course, related to the level of intelligence. The rituals and compulsions of the more intelligent children were usually more complex and involved than those of the less intelligent. This was reflected in the rather lower incidence of obsessive phenomena (other than abnormal attachments, abnormal preoccupations, non-adaptability or resistance to change which were unrelated to IQ) among the psychotic children of IQ below 60. However, on the whole the general type of behavioural abnormalities showed little relationship to the level of intelligence. The features most characteristic of infantile psychosis were present with approximately the same frequency in children of all levels of IQ.

Comparison with Other Groups of Psychotic Children

The chief features of the present group of psychotic children were a marked preponderance of boys, an absence of psychosis in other members of the family, middle class (and especially professional) family background, marked variability in intellectual functioning, an onset of psychosis in early infancy, and a disorder with the following behavioural features: 'autistic' relationships with people, marked retardation of speech development, a lack of response to auditory stimuli, pronominal reversal and echolalia when speech developed, various ritualistic and compulsive phenomena (frequently including a striking resistance to change), stereotyped repetitive mannerisms, short attention span on given tasks together with non-distractibility, and a tendency to self-injury.

The children fulfil the 'nine points' outlined by the British Working Party (Creak *et al.*, 1961) and there are close similarities in social, psychological and behavioural characteristics with the psychotic children described by Creak (1951, 1962, 1963a and b) and the autistic children studied by Kanner and Eisenberg (Kanner, 1943, Eisenberg and Kanner, 1956; Eisenberg, 1956). The children studied by Norman (1954 and 1955), by Wolff and Chess (1965a and b) by Mittler and his colleagues (1966) and those termed autistic by Despert and

Sherwin (1958) were also fairly similar. The 'atypical' children studied by Reiser and Brown (Brown, 1960 and 1963; Reiser and Brown, 1964), Ansell's group of psychotic children (Ansell, 1963), and the early onset 'pseudo-defective' children investigated by Bender (1947; 1955; 1959) overlap to some extent with the present group, but each probably includes many children who would not have been included here.

On the other hand, the present group of psychotic children appears different from the groups of children with a later onset such as described by Potter (1933), Bender (1947, 1955 and 1956), Piotrowski (1933 and 1937), and others. The features which differentiate early and later onset cases have been outlined in recent reviews by Eisenberg (1966) and by Rutter (1967).

Although there are many close similarities between this Maudsley group of children and the autistic children studied by Kanner and Eisenberg, a few differences should also be mentioned. There are three children in the present series in whom the psychosis did not appear until after the age of 3 years, and on these grounds they would not have been termed autistic by the Johns Hopkins workers. Two of these three children showed a profound regression of the type described by Heller, both had a very poor outcome, and although unequivocal evidence of brain disease was lacking in both, the disorders probably should be classified as Heller's disease. Other cases of regressive disorder at 3 to 5 years (not included in the present investigation) suggest that the prognosis in this group is usually bad, and the aetiology is often found to be some form of degenerative brain disease.

The disorder of the third child in whose case the onset was after the third birthday poses a more difficult problem in classification. In spite of a very late onset (age 5 years) the clinical features seemed similar to Kanner's cases of infantile autism. In addition, the outcome was rather better than most children with a regressive disorder beginning in middle childhood. The boy's development and progress up to the age of 5 years appeared entirely normal. Then during his first year at school, speech deterior-

ated, screaming attacks began, and he became increasingly inaccessible, autistic and withdrawn. When he attended hospital at the age of 7 years he was aloof and solitary, with no interest in people, and did not mix or play with other children. However, he would sometimes follow quite complex instructions, showed good interest in objects, and on some cognitive tests performed at or above age-level; on others he was untestable. He spoke little, apart from the repetition of phrases, and he showed pronominal reversal. His motor co-ordination was good, he was moderately overactive and he often jumped up and down screaming. In general, he appeared oblivious of external stimuli, but he stubbornly resisted all changes and insisted that everything had to be done in the way and in the order that it had been done previously.

Kanner might also have eliminated the nine children in whom the psychosis developed in the third year of the child's life after an apparently normal development up to the age of 2 years. However, in terms of family background, behavioural characteristics (and outcome) these children did not differ from the rest of the group. In the present state of knowledge there seems to be little point in classifying these children differently.

The present series also differs somewhat from the Johns Hopkins series in the frequency with which organic features were associated with psychosis. The difference may be more apparent than real in that all the children in this investigation were seen personally at follow-up, whereas Eisenberg had to rely on hospital reports in many of his cases. The difference between the two series is most marked in relation to the frequency with which fits developed during adolescence. As many of the children had only three or four fits altogether, hospital reports might well have omitted this information unless it were specifically requested. In addition, the children who developed fits tended to be of lower IQ than the others, and as fewer exhibited peaks of ability in limited areas ('islets of intelligence') some might have been excluded by Kanner and Eisenberg on the grounds of insufficient evidence of a normal intellectual potential. On the other hand, fits were reported in some of Kanner's children, and the epileptic

children were indistinguishable from the rest at the time they first attended the Maudsley Hospital at about the age of 5 years. Many of the apparently brain-injured children (especially the non-epileptic) were of normal intelligence and had disorders closely similar to Kanner's classical description of infantile autism in 1943.

It is important to search for differences between disorders associated and those not associated with probable brain injury, between those disorders manifest in early infancy and those beginning after a short period of apparently normal development, between psychotic children of subnormal intelligence and those of normal intellect, and these comparisons will be made when reporting the findings at follow-up. However, in view of the generally close similarities between the children, and because of the lack of any satisfactory criteria for further subdivision, the group will be considered as a whole for most purposes. The present writers would have classified separately the two children with a Heller-type disorder, but the number is not sufficient to justify their separate consideration.

SUMMARY

In the first of a series of papers on a five to fifteen year follow-up, a group of children with infantile psychosis is described. The group consisted of the 63 children who were all those who attended the Maudsley Hospital between 1950 to 1958 inclusive, who were seen before the onset of any signs of pubescence and for whom an unequivocal diagnosis of child psychosis, schizophrenic syndrome of childhood, infantile autism or any synonyms of these had been agreed by all consultant psychiatrists at the Maudsley Hospital who had seen the child. The group is compared with a group of non-psychotic children who attended the same hospital at the same time, and who were individually matched for age, sex, and IQ.

There was a marked preponderance of boys among the psychotic children (4:25:1). In most cases psychotic development had been evident in early infancy with no preceding period of normal development, but in a fifth of the cases there was a fairly convincing history of two to three years normal development before there were any signs of psychosis. The chief distinguish-

ing behavioural features were autistic relationships with people, marked retardation of speech, a lack of response to auditory stimuli, pronominal reversal and echolalia when speech developed, various ritualistic and compulsive phenomena (frequently including a striking resistance to change), stereotyped repetitive mannerisms, short attention span on given tasks together with non-distractibility, and a tendency to self-injury. Extreme variability in intellectual functioning was also quite common. There was a significant excess of children from professional backgrounds, an excess of first-born children in two-child families, and not many 'broken homes'. Although several of the parents had had psychiatric treatment, none had been or were psychotic. At most, the rate of psychosis in the sibs was 2.4 per cent., but none of the sibs had a fully developed psychotic disorder. None of the children showed unequivocal abnormalities on a neurological examination when they first attended the hospital, but in a quarter evidence obtained during the follow-up period suggested the probability of some form of brain injury. Although the range of intelligence among the children was very great, the differences in intellect were associated with few differences in behavioural characteristics. It is concluded that the children are closely similar to those with infantile autism described by Kanner (1943).

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