

elucidates the *conversion* of Freud, by which the *affective element* determines the somatic symptoms—which constitutes the most mysterious point in the theory of the German neurologist.

In a word, it seems to me that my theory not only is not in contradiction to the principal theories which have been advanced in the study of this malady, but that it clears up the most obscure points in these theories, thus rendering them easier of acceptance. It is for this reason that I venture to hope that it will be welcomed by all neurologists, and particularly by those authors whose names are associated with this interesting affection.

Relative Degrees of Dulness and Backwardness in School-Children and their Causation. By H. R. BURPITT, M.D.,
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THE following investigation deals with 400 children (200 boys and 200 girls) between the ages of 7 and 14, considered by the teachers, and after examination by myself, to be dull and backward, but not to fall within the meaning of the definition of feeble-minded as given in the Mental Deficiency Act of 1913—*i.e.*, persons in whose case there exists from birth, or an early age, mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection, or for the protection of others; or in the case of children, that they by reason of such defectiveness appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools.

The defects, and other abnormal conditions, ascertained in the case of these children are given in the following table :

TABLE I.

	<i>per cent.</i>
Family history of mental defect (including insanity)	3·5
Family history of dulness	11
Family history of epilepsy	1·25
Family history of tuberculosis	9
Unfavourable home surroundings	25

	<i>per cent.</i>
Irregular attendance	52
Inherent dulness (not amounting to feeble-mindedness)	34'25*
More marked inherent dulness (? mental defect)	1'75*

Physical Defects.

Adenoids and tonsillar disease	18'75
Deafness (apart from above)	4'75
Defective vision ($\frac{6}{18}$ or worse in one or both eyes)	14'5
Nutrition below normal	15'5
Defective speech	4

A family history of amentia and insanity was present in 3'5 *per cent.* of cases. Owing to the sensitiveness of people on this matter, it is probably higher than this.

The ratio of 11 *per cent.* for dulness in the family, based largely on the information of teachers who had known older brothers and sisters, is probably also underrated.

A family history of tuberculosis was obtained in 9 *per cent.* of cases. This is nearly twice as great as that for the children for the area taken as a whole.

Unfavourable home conditions are much more frequent than in the case of ordinary children.

Irregular attendance is bound up with these, and was the commonest condition present.

Inherent dulness of all degrees occurred in about one-third of the cases, and, next to irregular attendance, was the most frequent condition present.

Of the physical defects, adenoids, tonsillar disease, and deafness are more prevalent than amongst the children of the area as a whole.

The percentage of defective vision is also greater than that observed in an equal admixture of sexes and ages of the general population, and includes many of the most marked cases of errors of refraction, corneal opacities, etc. There is no doubt that uncorrected defective vision is a common cause of backwardness, which is constantly being proved, according to the statements of teachers, by the more rapid progress made by these children after wearing spectacles.

Malnutrition is about three times as great as in the case of

* See footnote on p. 399.

ordinary children, a statement which is corroborated by the improvement in lessons of those put on the free dinner list.

Speech defects are also about three times as frequent as ordinarily met with.

The absolute degree of retardation of each child was investigated, and classified according to the number of standards he or she was behind the normal. For this purpose it was assumed that a normal child aged eight should reach Standard 1—this errs somewhat on the side of leniency to the child—and, then progress one standard for each subsequent year thus :

8 years = Standard 1.	12 years = Standard 5.
9 years = Standard 2.	13 years = Standard 6.
10 years = Standard 3.	14 years = Standard 7.
11 years = Standard 4.	

In the examination of the dull and backward class—in fact of all the retarded—it is also necessary to ascertain the relative extent of the retardation. A child may be one standard or more behind, but a statement to this effect does not alone convey the true state of things. The age must also be given. A year's retardation—real and not apparent, and only ascertained after elimination of conditions such as shyness, which are more common in the younger children—early in school life is more serious than towards the end of the career. The younger child would probably be mentally defective ; the older one only a little dull and backward.

It is better then to express the backwardness by some form of equation indicative of the degree of backwardness in ratio to the normal, rather than to use the loose term “so many years retarded.” A useful system of equations is easily found : *sic.*, a 9 year old child should be in Standard 2, and if he has only reached Standard 1 has lost 1 year. The school life is practically always age of child minus 5 ; a few children who are delicate, or whose parents are of nomadic habits, may start school later than 5, but their number is negligible, and, where school is begun earlier, there is no serious teaching.

A backward child of 9 should be expressed fractionally as

$\frac{1}{9-5}$, *i.e.* = $\frac{1}{4}$, or in other words he has fallen behind 1 year in 4.

Again, a child of 13 in Standard 4 is 2 years behind, and is

represented *qua* backwardness by the fraction $\frac{2}{3}$. He has lost 2 years in a school life of 8, and is proportionately equal to the child of 9 who is in Standard I.

The backwardness of school-children may then be expressed arithmetically in terms of the number of years behind, compared with the number of years already spent in school. As the normal school life is composed of 9 periods of 1 year each, the lowest unit of backwardness is $\frac{1}{9}$, and the range from $\frac{1}{9}$ to $\frac{8}{9}$, the higher fractions being only applicable to imbeciles and idiots who had been retained at school, a practice which, of course, is not existent in ordinary schools.

The different degrees of backwardness which children under this definition exhibit are shown in the following table :

TABLE II

	Age 7.	Age 8.	Age 9.	Age 10.	Age 11.	Age 12.	Age 13.	Age 14.
Retarded 1 year .	$\frac{1}{9}$	$\frac{1}{8}$	$\frac{1}{7}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$
Retarded 2 years .	$\frac{2}{9}$	$\frac{2}{8}$	$\frac{2}{7}$	$\frac{2}{6}$	$\frac{2}{5}$	$\frac{2}{4}$	$\frac{2}{3}$	$\frac{2}{2}$
Retarded 3 years .	—	$\frac{3}{8}$	$\frac{3}{7}$	$\frac{3}{6}$	$\frac{3}{5}$	$\frac{3}{4}$	$\frac{3}{3}$	$\frac{3}{2}$
Retarded 4 years .	—	—	$\frac{4}{7}$	$\frac{4}{6}$	$\frac{4}{5}$	$\frac{4}{4}$	$\frac{4}{3}$	$\frac{4}{2}$
Retarded 5 years .	—	—	—	$\frac{5}{6}$	$\frac{5}{5}$	$\frac{5}{4}$	$\frac{5}{3}$	$\frac{5}{2}$
Retarded 6 years .	—	—	—	—	$\frac{6}{5}$	$\frac{6}{4}$	$\frac{6}{3}$	$\frac{6}{2}$
Retarded 7 years .	—	—	—	—	—	$\frac{7}{4}$	$\frac{7}{3}$	$\frac{7}{2}$
Retarded 8 years .	—	—	—	—	—	—	$\frac{8}{3}$	$\frac{8}{2}$
Retarded 9 years .	—	—	—	—	—	—	—	$\frac{9}{2}$

Reading the lines of this table horizontally, it is seen how much less serious a retardation of 1 year becomes as the higher ages are reached ; at age 7 it indicates a half, at age 14 only one ninth.

In the next line the conclusion is more serious. A 2 years' retardation in a child who had been in a school 2 years would mean that it had learnt nothing, and unless there is some physical explanation the child is an imbecile or idiot.

In the fourth horizontal column the first fractions would indicate idiots ; the next imbeciles ; the last two would probably indicate feeble-minded, in the absence of physical causes.

A retardation of 7 years would probably indicate idiocy and imbecility throughout the line, the fractions being greater than would be found in children at school of average normal mentality.

It can also be seen readily which of the fractions are of the same arithmetical value, indicating children of different age, in different standards, yet on relatively the same mental level. Thus, first fraction vertical column age $7 = \frac{1}{2}$, second fraction vertical column age $9 = \frac{2}{3}$, third fraction vertical column age $11 = \frac{3}{4}$, fourth fraction vertical column age $13 = \frac{4}{5}$, all indicate children on the same mental level.

Of the 400 children reviewed, the boys and girls were practically equally distributed at all stages, and the groups into which they fell are shown in the following table, and compared with the succeeding mentally inferior class—the feeble-minded.

TABLE III.

	$\frac{1}{2}-\frac{2}{3}$	$\frac{2}{3}-\frac{3}{4}$	$\frac{3}{4}-\frac{4}{5}$	$\frac{4}{5}-\frac{5}{6}$	$\frac{5}{6}-\frac{6}{7}$	$\frac{6}{7}-\frac{7}{8}$	$\frac{7}{8}-\frac{8}{9}$
Dull and backward .	48.5	33.75	11.5	6	2.5	0	0
Feeble-minded . .	5.4	24.3	40.5	16.3	13.5	0	0

A child more than 3 years retarded, *i.e.*, $\frac{1}{3}$, unless there are physical, or other than mental causes, to account for it, is generally mentally defective (feeble-minded or worse), and without such causes the children in columns 3, 4, 5 in Table III come within this category.

Eighty-two *per cent.* of the dull and backward group are in the first and second columns above the line of demarcation ($\frac{3}{4}$), and 70 *per cent.* of the feeble-minded are below the line. Thirty *per cent.* of the feeble-minded come in columns 1 and 2, and at first sight appear to be wrongly so placed. The explanation of the anomaly is that it is largely the practice for such children to be advanced to higher standards than they are mentally fitted for. This may apply also to the backwards, but not to the same extent, partly because they are not such a nuisance as the feeble-minded.

There remains for consideration 18 *per cent.* of dull and backwards who are apparently mentally defective. In children, like others, there are all stages of mental ability. A child who is backward solely on account of inherent mental incapacity is suffering in the same way as a mental defective, but in a lesser degree, and would be adjudged to be feeble-

minded only when the amount is excessive. The additional burden of physical defects, or other detrimental conditions, would have the effect of raising him from the $\frac{1}{3}$ - $\frac{2}{3}$ to $\frac{4}{5}$ - $\frac{6}{6}$ or higher groups, according to their number and severity, or they alone, without inherent mental inferiority, might relegate him to one of these later groups.

To what extent this is true of our 18 *per cent.* (71) of cases may now be considered.

TABLE IV.

Causes.		Forty-six children. $\frac{2}{3}$ - $\frac{3}{3}$	Twenty-four children. $\frac{3}{3}$ - $\frac{4}{3}$
(a)	Inherent dulness only	8	3
(b)	” ” and referred for further exami- nation <i>re</i> M.D.	3	0
(c)	” ” and one or more physical defects	7	2
	” ” and employed out of school hours	2	1
(d)	” ” and irregular in attendance .	6	8
	” ” and deprivation (general)* .	0	1
	” ” and late in start- ing school .	1	0
(e)	Late in starting school	1	1
	Irregular attendance and employed out of school hours	4	0
	” ” with one or more physi- cal defects .	9	6
(f)	Irregular attendance	2	3
	Adenoids only	2	0
	Inattentive to lessons	1	0

* “General,” as distinct from sense deprivation, *i.e.* where the child has not received proper attention such as children usually receive, as, for instance, where a child was kept in a cellar up to the period of adolescence.

$\frac{5}{8}$ to $\frac{6}{8}$ group.

There is one child only under this, a brother to the child referred to in clause (e), and the same remarks apply.

(a) We have in this area, as there are in others, children who are naturally dull only as regards their lessons, and who may be said to be permanently incapable of receiving proper benefit from the instruction in ordinary schools, yet they cannot be considered to be mentally defective within the meaning of the definition of the Mental Deficiency Act. Inquiries show that their parents made no better progress at school, yet have been able to take their places in society, and manage their own affairs even better than many of those who surpassed them in scholastic attainment.

(b) One also had defective vision and adenoids.

(c) Adenoids, defective vision, etc.

(d) One had had phthisis, and four were very malnourished.

(e) One child had only had about six months' schooling. He had been living in a caravan. In the six months he had made great progress, and was able to read.

(f) One child in the $\frac{4}{8}$ — $\frac{5}{8}$ group had had hip disease, another in the same group had until recently attended an unsatisfactory school.

The above are among the reasons why these children, although they appear in the most advanced groups, are regarded as dull and backward, and not mentally defective.

Another query as regards backwardness is suggested, *viz.*, What conditions are responsible for the lesser degrees? What relation do different causes bear to different degrees of retardation, and to what extent is the same cause of varying intensity productive of slighter or greater degrees? Is inherent dulness mainly responsible, or do physical defects, such as adenoids, come more into play in the production of slighter or more severe stages of backwardness? Is there a greater proportion of single causes in children slightly retarded, and with what success can the growing intellectuality of the otherwise presumably normal child struggle against multiple causes?

Such are some of the questions which arise, and an attempt has been made to answer them, firstly, by dividing the 400 children into two groups of slighter, *i.e.*, $\frac{1}{8}$ to $\frac{5}{8}$, and more marked, $\frac{4}{8}$ to $\frac{6}{8}$, retardation, and, secondly, by inquiry as to the number of causative factors present.

TABLE V.

Single Causes.

One hundred and seventy cases out of the 400 were due to a single cause. In 89 *per cent.* this resulted in a minor, and in 11 *per cent.* in a greater retardation.

Number of children	151	.	19
Retardation . . .	$\frac{1}{3}$ - $\frac{3}{8}$.	$\frac{3}{8}$ - $\frac{6}{8}$
Irregular attendance . . .	51	.	6
Adenoids	24	.	2
Defective vision	12	.	—
Ringworm of scalp	2	.	—
Malnutrition	2	.	—
Chorea	1	.	—
Inherent dulness	59	.	11

Multiple Causes.

Two hundred and thirty children were affected through multiple causes, and the result of these was to place 77 *per cent.* in the minor group, and 23 *per cent.* in the major.

Number of children . . .	178	52
Retardation	$\frac{1}{3}$ - $\frac{3}{8}$	$\frac{3}{8}$ - $\frac{6}{8}$
Two conditions present . . .	108	27
Three " "	53	16
Four " "	15	7
Five " "	1	2
Six " "	1	—

The conclusions deduced from these figures are :

Single causes as a rule do not produce backwardness beyond $\frac{3}{8}$. Multiple causes do so more frequently, and proportionately to the number of causes.

The presence of two more often produces a backwardness of less than $\frac{3}{8}$; the effects of three are approximately equally reflected in both groups; and after this there is a much greater probability of the retardation being severe.

Irregular attendance alone is often a sufficient cause of children being put in the more markedly defective group. Physical defects do not usually, of themselves, cause retardation beyond first group.

This inquiry had for its object the definition of the degrees of backwardness and dulness (all were backward, part were dull, *i.e.*, backward by reason of inherent mental incapacity), and the causation thereof, but the opportunity is also taken to briefly survey these causes, and discover what ameliorative measures are thereby indicated as desirable.

The outstanding ætiological factors are :

Physical defects (53 *per cent.*), irregularity of attendance (52 *per cent.*), unfavourable home surroundings (25 *per cent.*), inherent dulness (36 *per cent.*).

Dealing with physical defects first, although they amount in the aggregate to 53 *per cent.* (omitting defective speech, which is a secondary condition), in 10 *per cent.* only do they represent the sole cause. This is made up of those cases where the defect is of such intensity as to produce retardation in otherwise ordinary children, and of other cases of lesser intensity, but sufficient to weigh down the balance against those near the level of what we may call for convenience the lowerlimit of normal intelligence.

The importance of physical defects as causative factors must not be minimised, for in the aggregate their effect is very great. Means are available, and are now more or less adequately provided for by Local Education Authorities, under the Education (Administrative Provisions) Act, 1907, to treat such defects in children of school age. The need will not be entirely met until children under school age are provided for in similar manner, because untreated defects among them are often attended with consequences which are permanently crippling.

Irregularity of attendance was present in 52 *per cent.* of the children. As a single factor it was present in only 15 *per cent.* Irregularity of attendance will always remain a frequent cause, until the advent of an improvement in the general health of the school child, better home conditions, and a more enlightened and educated body of parents.

Unfavourable home surroundings were recorded in 25 *per cent.* of the cases. It is not given as the sole cause in any instance, as other fundamental conditions were not difficult to trace. Unfavourable homes are to a large extent a reflex of mental abnormality or inferiority, such as ignorance, drunkenness and crime.

Poverty was often the apparent reason, and it must be understood that, though in many cases this is due to misfortune, and may be the result of a cruel economic system, nevertheless it is those most inefficient mentally, or with vices indicative of instability of mind, who are the first to go under. Although contributory and aggravative, the influence of this condition as a primary cause is probably slight. As regards amelioration, education, improved housing, and attention to public health are essential for this as for other sections of society, though by themselves they will prove inadequate, unless other measures are adopted to raise the mental and moral tone of this class.

Inherent dulness, although only put down after a thorough scrutiny of all other causes, was present in 36 *per cent.*

It was a sole factor in 17 *per cent.* of the 400 children.

A family history of dulness, epilepsy, and mental defect was obtained in 16 *per cent.*, which, owing to the difficulty of extracting the full truth, is probably an under-estimate.

Because it was easier to assess the extent to which physical defects and factors other than inherent dulness, operated as causes, the estimate of the amount of the latter here given is probably too low, and if it had been possible to trace with certainty every case to its source, a ratio nearer 50 than 36 *per cent.* would have been arrived at. This apart, the figures here given indicate that the chief cause of backwardness in school children is inherent mental incapacity, and that the problem of how best to deal with such cases will not be adequately solved until that respecting the classes from which they are chiefly recruited—*viz.*, the feeble-minded, imbecile, idiot, insane, and mentally abnormal generally—has been satisfactorily adjusted.

Nucleinate of Soda: Its Use in Acute Mental Disorders. By COLIN MCDOWALL, M.D.

AT a time when there is a gradual but certain change spreading through our methods of treatment of the insane, and chemical compounds are being replaced by other methods, it may appear unnecessary to record results obtained by the use of drugs. But this short paper is intended only to give