

## AN INQUIRY INTO THE HEALTH OF SCHOOL ENTRANTS IN A SUBURBAN AREA.

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### INTRODUCTION.

IT will soon be a quarter of a century since care and supervision of young children became a regular and important feature of our national public health system. Official publications, both of national and municipal authorities, have contained great masses of information respecting the results of this system. Valuable as these publications are, it is obvious that reports upon a national scale must assemble many data which are not strictly comparable among themselves, while official local publications must, having regard to the urgent needs of financial economy, omit much information which is of scientific importance. Hence there is room for individual reports and it is hoped that the present paper, based upon the writer's personal experience and analysis of records in the suburban district of Willesden, may contribute something of value to the discussion of a very important topic.

This paper is divided into two parts: the first consists of a comparison between the present Willesden entrants and those of former years; the second is a more detailed study of the condition at routine medical inspection of a certain group of 1926 entrants and of their previous medical histories as revealed by such records as are available.

### PART I.

#### COMPARISON BETWEEN THE WILLESDEN SCHOOL ENTRANT NOW AND IN FORMER TIMES.

This is based upon information obtained from a number of head teachers who have been dealing with entrant children in Willesden for a considerable number of years; on the findings of routine medical inspection at various periods since 1907; and on a study of statistics relating to the common diseases of childhood.

## OPINIONS OF TEACHERS DEALING WITH ENTRANT CHILDREN.

A questionnaire was sent to the heads of all the infant departments of Willesden elementary schools asking for their views as to the condition of the children at their entry into school now as compared with past experience.

Replies were received from 18 teachers whose average numbers of years of observation was fifteen; 6 had had twenty or more years of work among Willesden entrants.

Opinions were asked for respecting: cleanliness—head, body, and clothing; general condition—size, colour, physique, energy; running ears; mouth breathing; sores and inflammation of the eyes; control of the bladder and bowels; nervous conditions—habit spasms, excessive nervousness; social adaptation—amenability to discipline, relations with other children, interest in work and games, number of difficult children; mental condition in relation to education; squint; sickness rate during the first year of school life.

To sum up these opinions very briefly, the conclusion reached was that the Willesden child enters school cleaner in head and body, and more comfortably and suitably dressed; that it is on the whole of better physique, and that it is mentally readier to obtain benefit from the education offered to it.

It is thought that children are practically free from discharging ears and deafness, and seldom troubled by squint or by external eye disease. They are thought, however, to be still prone to suffer from small sores and impetigo, and to need education in nasal hygiene, and attention to defects of nose and throat.

The children are socially more adaptable, freer from repressions, and have more zest for the business of life, but there is some evidence of a tendency to slight nervous instability, which may show itself in one case as lack of concentration and in another perhaps by diminished control over the organic reflexes.

Resistance to disease as shown by the sickness incidence during the first year at school, is as good as, if not better than, it used to be, and when children fall sick they are probably better treated than in even the recent past.

## FINDINGS OF ROUTINE MEDICAL INSPECTION.

Medical inspection was begun in Willesden, as elsewhere, in 1907 and continued till the end of 1915, when it came to an end on account of the War and was not resumed until 1922. Since that date there has been no interruption.

Table I gives the findings of routine medical inspection of Willesden entrants at various periods since 1907.

Where the earlier findings are incomplete this is because information under the headings in question was not then recorded.

The periods chosen depend partly upon the availability of records relating to entrants as apart from other groups, but they happen to coincide with certain stages of medical inspection in Willesden that present interesting points for comparison.

By the year 1909 medical inspection was well under way; the findings then may be taken as showing the condition in which the community with the social

services then at its disposal delivered its young infants over to the State to educate.

The period 1914–15 was too early for the War to have had time to affect the home environment of entrants, and also shows the result of five years of effort on the part of the School Medical Service, working almost alone so far as any influence on the pre-school child was concerned since, at that time, such health visiting as was undertaken did not attempt to cover this ground.

When inspection began again in 1922, the entrant child might well show signs of the evil effects of War and post-War economics. Its condition might also perhaps testify to neglect of medical attention, owing to shortage of doctors and nurses. On the other hand, during the six years' interval, from the end of 1915 to the beginning of 1922, maternity and child welfare work in Willesden, from very small beginnings, had rapidly expanded. By the end of 1918 indeed, all the essential elements of its highly organised scheme for the care of mothers and children under five years were already in being.

It was during this interval also that the whole community began to awake to the necessity of active co-operation in this work. The returns for 1926–27 record the progress made after five more years of this co-operation and show what is left undone.

Table. I. *Showing the number of entrants found suffering from certain defects at routine medical inspection at various periods since 1907.*

Years ... ..	1909 and 1910		1914 and 1915		1922		1926 and 1927	
Numbers dealt with in this table ...	3947		5072		1753		4223	
Found suffering ... ..	No.	%	No.	%	No.	%	No.	%
Malnutrition (all degrees) ... ..	397	10.0	508	10.0	191	10.9	469	11.1
Skin diseases ... ..	—	—	72	1.4	49	2.7	99	2.3
Squint ... ..	56	1.4	53*	2.3*	24	1.3	34	0.8
External eye disease ... ..	63	1.5	112	2.2	57	3.1	51	1.2
Deafness ... ..	140	3.5	—	—	9	0.5	12	0.3
Ear disease ... ..	133	3.3	146	2.8	38	2.1	37	0.9
Defects of throat and nose ... ..	2243	56.8	1355	26.7	515	29.3	1068	25.3
Enlarged cervical glands (non-tubercular) ... ..	1269	32.1	631	12.4	300	17.0	585	13.8
Speech defects... ..	201	5.1	44	0.8	9	0.5	42	1.0
Dental defects... ..	2321	58.8	2811	55.2	886	50.5	1473	34.8
Defects of heart and circulation:								
Organic heart disease ... ..	—	—	93	1.8	11	0.6	9	0.2
Functional heart defects ... ..	146	3.7	19	0.37	38	2.1	24	0.5
Anaemia ... ..	—	—	209	4.1	56	3.1	6	0.1
Lung defects (non-tubercular) ... ..	132	3.3	131	2.5	159	9.0	48	1.1
Tuberculosis:								
Pulmonary ... ..	23	0.6	0	0.0	1	0.06	0	0.0
Non-pulmonary ... ..	—	—	12	0.2	11	0.6	0	0.0
Defects of the nervous system ... ..	42	1.06	18	0.3	11	0.6	46	1.0
Deformities (including those due to rickets) ... ..	202	5.0	180	3.5	61	3.4	60	1.4
Other miscellaneous defects ... ..	—	—	—	—	167	9.5	156	3.6

\* 1915 only.

From a statistical point of view Table I is open to the objection that it compares things which are not strictly comparable.

Although the methods of recording defects and the summarising of them

have been uniform for many years in Willesden, in the first period studied medical inspection was carried out by a number of local general practitioners, and at subsequent periods by several whole-time officers, each operating in one part of the district, and remaining in office for a varying number of years.

There must therefore have been different judgments as to what constituted a defect worth recording, a disadvantage inseparable from all Public Health records of this kind.

Another objection is that the standard of the whole medical staff might change from one period to another. As regards this point it would most probably become higher, so that if the percentage of defects recorded becomes less, one may fairly assume some improvement in the state of the population.

Table I should be looked upon not as an exact statistical record, but as a rough comparison of different periods from which some useful information may be obtained.

Subject to the implied reservations, it is apparent from this table that the first improvement was a halving or more of the number of cases of throat and nose defects and their concomitant enlarged cervical glands, and a reduction in the number of cases of ear disease, lung defects, nervous affections, and deformities. This may have meant that gross defects were being dealt with in the young child before its entry into school, and that its general health was beginning to receive some attention.

On resumption of medical inspection in 1922, throat and nose defects were slightly more frequent, and ear disease was still fairly common. On the other hand, deafness now showed a notable reduction as compared with early years, being found in only 5 instead of in 35 per thousand children. Whether this reduction in deafness took place between 1907 and 1915, and is to be ascribed to the treatment of gross defects of the throat such as adenoids, or whether it occurred at a later date as a result of the opening of clinics for the treatment of ear disease to which children under five had access and which they did attend in fair numbers from 1918 onwards, it is not possible to determine from the available records.

Anaemia and dental defects now showed some reduction in number, and there was a shifting of the proportion as between organic and functional heart defects due probably to better diagnosis. The high percentage of lung defects may have been due to some accidental cause.

The last period to be considered is 1926-7. Comparing this with all the previous ones, we find malnutrition standing actually at a higher figure, and defects of the throat and nose and enlarged cervical glands practically at a standstill. Since the first improvement in 1914-15, the incidence of skin disease showed little change, and nervous affections and speech defects seemed to have become commoner. With regard to the latter two, however, their definition is too vague for any conclusion to be drawn. It is likely, for instance, that in the 1909 records certain abnormalities of speech associated with gross adenoid obstruction were included among the defects noted, and that later

on only defects of articulation and stammering would be so included. All other defects showed reduction.

Thus, for every thousand entrants examined in the years 1926-7, there were 3 deaf as compared with 35 in 1909-10; there were 9 cases of ear disease as compared with 28 in 1914-15; and only one recorded case of anaemia instead of 41 in 1914-15. Cases of external eye disease were fewer, and squints were fewer. There was no tuberculosis. Deformities were reduced to about one-third of those found in 1914-15, and lung defects to about one-half.

According to these records, the main failure has been in regard to nutrition. The difficulties of assessing this are well known, and a satisfactory "standard of health norm" is still to seek.

Meantime heights and weights, though not furnishing the desired criterion, have some bearing on the subject, and an attempt has been made to obtain some idea of the measurements of present-day entrants as compared with those of earlier years. Fortunately there is a record of the average heights and weights of two groups of Willesden entrants for the six-year period, 1909-14, and Table II shows how the corresponding group of children for 1926 stand by comparison.

Table II. *Giving particulars of heights and weights in two groups of Willesden entrants.*

		Boys.			Nutrition
Age group	Years	No. dealt with	Average height in inches (in cm.)	Average weight in lb. (in kg.)	quotient lb. per inch (gm. per cm.)
5 to 6 years	1909-14	6313	42.04 (105.1)	38.72 (17.6)	0.921 (167.4)
	1926	400	42.80 (107.0)	40.04 (18.2)	0.935 (170.0)
6 to 7 years	1909-14	2385	43.72 (109.3)	41.58 (18.9)	0.951 (172.9)
	1926	411	43.52 (108.8)	41.36 (18.8)	0.950 (172.7)
		GIRLS.			Nutrition
Age group	Years	No. dealt with	Average height in inches (in cm.)	Average weight in lb. (in kg.)	quotient lb. per inch (gm. per cm.)
5 to 6 years	1909-14	5832	41.84 (104.6)	37.84 (17.2)	0.904 (164.4)
	1926	322	42.64 (106.6)	38.50 (17.5)	0.902 (164.1)
6 to 7 years	1909-14	2366	43.56 (108.9)	40.48 (18.4)	0.929 (168.9)
	1926	392	43.24 (108.1)	40.04 (18.2)	0.923 (168.3)

The numbers in the second group are too small for a just comparison, as they cannot allow for good and bad years, but they seem to indicate that by 1926 both boys and girls of five to six years were taller and heavier, the gain in weight of the girls being scarcely in proportion to the gain in height, and that in the older group both had fallen off a little. According to the "nutrition quotients," the five- to six-year-old boys were the only ones who had regained their pre-War level of nutrition.

These children were born in 1920-1, at a time when the transition from war to peace was going on, and when economic circumstances were bad in Willesden

as elsewhere; it is possible that there were deficiencies in ante-natal feeding, and that certain other unfavourable factors were at work locally.

Although it has not been possible to demonstrate it by exact figures, it certainly appeared to me in collecting data for Table II that the 1926 entrants had more defects all round than those of 1927, and in working out the heights and weights for 1926, that the children born in 1920 had more defects than those born in 1921.

*Dental defects.*

According to Table I these had decreased considerably by 1926-7. In order to test the accuracy of this inference, since the records used were the result of superficial observation, and there are many minor and hidden dental defects that can only be detected by the expert working with probe and mirror, Table III was worked out from the records of dental inspection by the school dentists, of whom there have been two operating in Willesden since 1918.

Table III. *Giving the percentage of Willesden entrants found suffering from defective teeth at dental inspection in certain years.*

Year	Ages 5-6			Ages 6-7			Ages 7-8		
	No. in-spected	No. found with dental defects	% with dental defects	No. in-spected	No. found with dental defects	% with dental defects	No. in-spected	No. found with dental defects	% with dental defects
1919	564	342	60.6	1030	784	76.1	703	613	87.1
1921	351	258	73.5	319	246	77.0	278	233	83.8
1922	268	187	69.7	730	500	68.4	618	434	70.2
1924	945	627	66.3	908	688	75.7	883	683	77.3
1926	338	214	63.3	1270	855	67.3	999	720	72.0
1927	414	298	71.9	792	589	74.3	1152	872	75.6

This table tells a different tale and shows that here too is a problem to be solved.

A study of the reports of other health authorities where this matter has been inquired into, reveals the fact that the same failure to obtain results in dental work with the pre-school child is noted and deplored.

STATISTICS RELATING TO THE COMMON FATAL OR DISABLING DISEASES OF CHILDHOOD.

These diseases, omitting neo-natal conditions, accidents, oddities, and influenza, because too difficult to separate from colds and catarrhs, are—measles, whooping cough, enteritis, respiratory diseases, tuberculosis, scarlet fever, diphtheria, organic heart disease, and rheumatism.

A comparison between their incidence, mortality, and age distribution now and before the passing of the Maternity and Child Welfare Act, might be expected to throw some light on the subject of this inquiry. A lower mortality rate, for instance, for such a disease as measles, implies not only the saving of lives, but also probably a smaller incidence, less severe or better nursed cases, or the deferring of attacks to a later and less dangerous age from the point of

*Health of School Entrants*Table IV. *Showing Willesden death rates at ages from certain diseases in successive periods since 1908.*

	1908-12*					
	Ages 0-5		Ages 5-15		All ages	
	Deaths	Death rate per 1000 pop. at risk	Deaths	Death rate per 1000 pop. at risk	Deaths	Death rate per 1000 pop. at risk
Measles ... ..	194	2.19	18	0.12	212	0.28
Whooping cough ... ..	187	2.11	7	0.05	194	0.25
Respiratory diseases (non-tubercular) ... ..	503	5.67	26	0.17	1228	1.59
Diarrhoea and enteritis ... ..	356	4.01	6	0.04	419	0.54
Scarlet fever ... ..	24	0.27	9	0.06	36	0.05
Diphtheria ... ..	32	0.36	22	0.14	56	0.07
Pulmonary tuberculosis ... ..	31	0.35	19	0.12	648	0.84
Non-pulmonary tuberculosis ... ..	110	1.24	38	0.24	203	0.26
Organic heart disease ... ..	10	0.11	25	0.16	676	0.88
Rheumatic fever ... ..	3	0.03	12	0.08	30	0.04
All causes ... ..	2798	31.51	324	2.08	8258	10.71
			1913-17†			
Measles ... ..	167	1.73	30	0.19	206	0.26
Whooping cough ... ..	150	1.56	11	0.07	161	0.20
Respiratory diseases (non-tubercular) ... ..	520	5.39	41	0.26	1343	1.67
Diarrhoea and enteritis ... ..	254	2.63	6	0.04	323	0.40
Scarlet fever ... ..	11	0.11	14	0.09	30	0.04
Diphtheria ... ..	56	0.58	38	0.24	99	0.12
Pulmonary tuberculosis ... ..	18	0.19	28	0.17	781	0.97
Non-pulmonary tuberculosis ... ..	105	1.09	55	0.34	217	0.27
Organic heart disease ... ..	8	0.08	20	0.12	920	1.14
Rheumatic fever ... ..	2	0.02	14	0.09	53	0.07
All causes ... ..	2434	25.23	380	2.36	8987	11.18
			1918-22‡			
Measles ... ..	92	1.34	9	0.06	112	0.14
Whooping cough ... ..	89	1.26	4	0.03	94	0.11
Respiratory diseases (non-tubercular) ... ..	405	5.91	45	0.29	1507	1.82
Diarrhoea and enteritis ... ..	134	1.96	9	0.06	172	0.21
Scarlet fever ... ..	6	0.09	18	0.12	28	0.03
Diphtheria ... ..	89	1.30	124	0.40	222	0.27
Pulmonary tuberculosis ... ..	6	0.09	26	0.17	582	0.70
Non-pulmonary tuberculosis ... ..	42	0.61	21	0.14	118	0.14
Organic heart disease ... ..	6	0.09	33	0.21	1083	1.31
Rheumatic fever ... ..	0	0.00	15	0.10	47	0.06
All causes ... ..	1803	26.31	511	3.30	9177	11.08
			1923-7§			
Measles ... ..	64	0.95	9	0.06	74	0.09
Whooping cough ... ..	72	1.07	3	0.02	75	0.09
Respiratory diseases (non-tubercular) ... ..	277	4.10	25	0.16	1310	1.55
Diarrhoea and enteritis ... ..	66	0.98	1	0.01	88	0.10
Scarlet fever ... ..	3	0.04	5	0.03	8	0.01
Diphtheria ... ..	47	0.70	30	0.19	86	0.10
Pulmonary tuberculosis ... ..	5	0.07	12	0.08	667	0.79
Non-pulmonary tuberculosis ... ..	37	0.55	24	0.15	117	0.14
Organic heart disease ... ..	4	0.06	15	0.09	1245	1.47
Rheumatic fever ... ..	2	0.03	8	0.05	34	0.04
All causes ... ..	1185	17.54	236	1.47	8440	9.99

\* Death rates based on Census population, 1911.

† Estimated population, 1915.

‡ Census population, 1925.

§ Estimated population, 1925.

view of permanent damage to health, all of which are to the advantage of the school entrant. Unfortunately the incidence of these diseases is impossible to measure with any accuracy. Even that of the infectious diseases is not known exactly, as certain of them, like whooping cough, although notifiable in Willesden, are not in fact all notified, some of the patients never seeing a doctor at all or only once, at a time when the illness is not diagnosable.

Mortality statistics are, however, available, and Table IV gives the total deaths for Willesden from each of the diseases specified above, at ages 0-5, 5-15, and at all ages, together with the mortality rates per thousand of the population at risk, for four quinquennial periods covering the whole twenty years since the institution of school medical inspection. It also shows the deaths and mortality rates from all causes over the same periods of time.

*Measles.* The fall in the death rate from this disease at the age of 0-5 is progressive, and in the last quinquennium it is less than half of what it was in the first. At ages 5-15, and at all ages, there is little change until 1918, after which a rapid diminution occurs. As regards the incidence of measles in Willesden, an attempt was made in the years previous to 1916 to estimate this from the actual total mortality as compared with the case mortality rate for cases known to the Health Authority. For purposes of comparison this has been followed up for the last quinquennium, and the result appears in Table V.

Table V. *Showing the known and estimated incidence of measles in Willesden during two quinquennial periods.*

Quinquennial period	Actual no. of cases of measles known to the Public Health Dept.	Actual no. of deaths that occurred among these	Actual fatality rate % among known cases	Additional measles deaths ascertained from returns of Registrar of Deaths	Estimated additional cases of measles corresponding to these—based on the fatality rate for known cases	Estimated total no. of cases of measles	Estimated no. of cases per 1000 population	Actual death rate per 1000 population
1912-16	6,678	65	0.97	128	13,195	19,873	24.0	0.23
1923-7	5,192	48	0.92	26	2,826	8,018	9.3	0.08

The second half of this table is based on the assumption that the mortality rate among unascertained cases is the same as that among cases known to the Health Authority. If this is correct, the figures seem to show that the incidence has been less of late years, and that, of the cases occurring, a larger proportion come to the notice of the Health Department.

*Whooping cough.* Here the same steady decline of mortality rate is seen, and follows almost exactly that for measles. There is no change in the age distribution. The great majority of all deaths from this disease are still taking place in the first five years of life. It has not been possible to build up for whooping cough a table similar to Table V. Whooping cough became notifiable in Willesden towards the end of 1917; the number of cases notified and their age incidence is shown below in Table VI.



Table VI. *Showing the age incidence of whooping cough since 1918.*

Years		Age 0-5		Over 5		All ages
		No. of cases	% of total incidence as notified	No. of cases	% of total incidence as notified	
1918-22	Cases notified	1026	63.4	591	36.6	1617
1923-7	Cases notified	1236	65.1	661	34.9	1897
1923-7	Cases known to the Health Dept. including those not notified	2867	55.2	2326	44.8	5193

The lowest line of figures in Table VI gives the total number of cases known to the Health Department during the last period as against the number notified, and is a good demonstration of the incompleteness of notification, especially at the older ages.

*Respiratory diseases.* Here the only improvement in the mortality rate occurs in the age group 0-5, and it is not apparent until the last quinquennium. The two middle periods account for the highest rates and these are the periods which included the War years and the great epidemic of influenza in 1918-19.

*Diarrhoea and enteritis.* The fall here is to about one-fifth. The proportion of these deaths that occur among children under five years is still high.

*Scarlet fever.* Apart from the steady decline in general mortality from this disease, the most noticeable thing is the reversal of the age distribution of deaths as between children under and over five years.

*Diphtheria.* The figures are not very encouraging, although the higher rates in the third quinquennium are accounted for by two epidemic years. Schick testing and immunisation being now available for all Willesden children, one may hope that the next five years may yield a better result.

*Tuberculosis.* Since 1908 there has been a slight decline in deaths from pulmonary, and a much greater decline in deaths from non-pulmonary tuberculosis among Willesden residents. The mortality rate among children under five from phthisis is one-fifth of what it was at the beginning, a difference too great to be accounted for by improved diagnosis alone. The mortality from both pulmonary and non-pulmonary tuberculosis increased among children of 5-15 during the second quinquennium, and in the case of pulmonary tuberculosis did not come down until the last.

*Organic heart disease.* Deaths from this cause have increased progressively in the community generally, but in children under fifteen they have been reduced almost to one-half.

*Rheumatic fever.* Here the numbers are too small and fluctuating to admit of deductions.

*All causes.* The general mortality rate after rising in the two middle periods, is reduced by nearly 1 per cent. in the last. In children under five it has come

down to little over one-half of what it was, and in the age group 5-15 it is also substantially reduced.

## PART II.

### CONDITION AND PREVIOUS HISTORY OF CERTAIN ENTRANT CHILDREN IN 1926.

Children come into school with certain defects, but there is often very little information as to how or when these defects arise. In Willesden an enquiry visit is paid shortly after each birth is notified, and if the visitor is welcomed, these visits are repeated several times during the first and second years, and once or oftener during subsequent years until the child enters school.

At these visits the health nurse makes an entry on the child's record sheet of any event relating to its health that comes to her knowledge. If the child attends one of the Council's clinics, there will be a note of the visit and a medical note. There will also be in some cases a record of the mother's history in regard to her confinement and ante-natal health; home circumstances, if specially adverse, will be known. Thus, for each child there is some sort of "dossier" by the time it reaches school age.

This "dossier" will often be incomplete. The child may be out at the time of the visit, the health visitor may be given no information, vital facts may be forgotten, or she herself be too busy to make full inquiries. In spite of this it was thought that these dossiers might contribute valuable information bearing upon the origin and prevention of the defects found at medical inspection.

Accordingly, a certain group of 1926 entrants was taken, those born in the years 1920 and 1921, who had been under observation by the Health Department since birth. A sheet was made out for every child, on which was noted year by year, any matter relating to its health, recorded through any of the sources mentioned above, and finally the result of its first routine examination in school. In all there were 1604 children, 848 boys and 756 girls. When completed the sheets were studied and tabulated.

This investigation is subject to the same objection as Table I, p. 106, of this paper, that it depends upon observations made by different people. At the same time it should be remembered that these people are well trained and experienced, and not at all likely to label a child as suffering from a defect which is entirely non-existent. Positive facts therefore, when noted, are of value, though blanks may merely mean that no information was available. The histories are also a test of the extent to which our present system of surveillance of our pre-school children succeeds in covering the ground.

In some of the tables, in order to reduce their size, percentages only are given, and the sexes are not kept separate in any. They were however studied apart and the chief differences noted as follows: from infancy onwards the girls had a higher percentage with defective nutrition, rickets, and external eye and skin diseases; and functional heart defects were twice, and definite rheumatism four times as common in them as in the boys at medical inspection. More of the boys suffered from speech defect and stammering, though there were

only four cases of the last in all, and more of them had mental defects. Squint cases were three times as common in boys. Girls had double the number of "dirty heads."

In respect of their infectious-disease histories, the percentage of girls who had suffered from measles, whooping cough, and pneumonia, was definitely higher, whereas more of the boys had had mumps, chicken pox, and scarlet fever. The percentage of histories of forceps delivery was higher in boys.

Table VII deals with the whole group and is designed to show the actual defects found at medical inspection and their degree of previous ascertainment.

Table VII. *Showing the condition at routine medical inspection and the previous ascertained history of defects in 1604 Willesden entrants examined in 1926.*

	Defect noted prior to medical inspection					Defect present at medical inspection		
	During 1st year %	During 2nd year %	During 3rd year %	During 4th year %	During medical inspection %	Definite %	Slight %	Total %
Defects of throat and nose (apart from operations for tonsils and adenoids)	3.8	4.36	2.11	3.49	4.42	26.48	10.29	36.77
Defective nutrition ... ..	12.71	7.54	3.55	5.23	4.61	2.18 ("poor")	24.31 ("fair")	26.49
Enlarged cervical glands ... ..	0.43	0.62	0.99	0.81	1.12	14.83	14.52	29.35
Decayed or defective teeth ... ..	0.06	0.56	1.24	4.37	5.36	58.6	—	58.6
Digestive defects ... ..	29.3	7.98	2.49	1.3	1.24	0.68	0.06	0.74
Lung defects (apart from pneumonia or broncho-pneumonia or tuberculosis)	20.76	6.10	2.56	2.18	1.74	—	—	2.36
Defects of the nervous system ... ..	2.61	2.86	1.37	1.8	1.43	1.79	0.68	2.41
Mental defects ... ..	—	—	—	—	—	—	—	4.37
Speech defects ... ..	0.0	0.06	0.0	0.12	0.18	1.8	0.68	2.48
Skin defects ... ..	8.79	6.54	2.86	3.17	3.17	1.74	2.46	4.17
External eye defects ... ..	4.68	1.43	0.62	0.93	0.81	1.6	0.43	2.03
Ear diseases (apart from mastoid operation) ... ..	2.74	1.12	0.87	0.87	0.93	1.18	0.43	1.61
Had operation for mastoid disease ... ..	0.24	0.06	0.06	0.06	0.06	—	—	0.56*
Deafness ... ..	0.0	0.0	0.0	0.12	0.0	0.43	0.12	0.55
Rheumatism (excluding chorea) ... ..	0.0	0.06	0.18	0.18	0.68	0.46 (rheumatism)	0.24 (growing pains)	0.7
Heart defects (including congenital defects) ... ..	0.06	0.06	0.0	0.06	0.24	0.37 (organic)	1.18 (functional)	1.55
Rickets or deformities ascribed to rickets ... ..	2.05	2.68	1.18	0.43	0.31	0.31	0.62	0.93
Other deformities (apart from congenital heart) ... ..	5.23	0.99	0.93	0.68	0.56	1.61	0.67	2.28
Squint (with or without defective vision) ... ..	0.24	0.43	0.43	0.81	1.18	1.3	0.18	1.48
Defective vision (without squint) ... ..	0.0	0.0	0.0	0.0	0.12	—	—	0.81
Condition of the head as regards cleanliness ... ..	—	—	—	—	—	1.12 (vermin)	8.10 (nits)	9.22

\* Total operated on before medical inspection.

The percentages given for the pre-school years include all degrees of the defect noted, but in the medical inspection columns a distinction has been made between those marked "slight" and the others.

Table VIII shows details of certain groups of defect.

It will be noted that of all the children examined, over 36 per cent. had

Table VIII. *Showing details of certain defects found in 1604 Willesden entrants examined in 1926.*

	Found suffering at medical inspection		
	Definite %	Slight %	Total %
<b>Throat and nose defects:</b>			
Enlarged tonsils ... ..	17.33	6.9	24.23
Adenoids or mouth breathing	2.55	0.68	3.2
Both ... ..	4.92	1.9	6.85
Other conditions as rhinitis	1.68	0.81	2.49
Total ... ..	26.48	10.29	36.77
<b>Defects of the nervous system:</b>			
Epilepsy or convulsions ...	0.18	0.00	0.18
Chorea ... ..	0.37	0.06	0.43
Other defects ... ..	1.24	0.62	1.8
Total ... ..	1.79	0.68	2.41
<b>Deformities other than rickets:</b>			
Congenital defects ... ..	1.12	0.37	1.49
Paralytic defects ... ..	0.12	0.06	0.18
Other, e.g. traumatic ... ..	0.37	0.24	0.61
Total ... ..	1.61	0.67	2.28
<b>Skin defects:</b>			
Eczemas and dermatitis ...	0.93	1.66	2.56
Impetigo and septic sores ...	0.81	0.74	1.55
Ringworm ... ..	0.00 (head)	0.06 (body)	0.06
Total ... ..	1.74	2.46	4.17

some defect of the throat or nose, 10 per cent. being marked "slight." Among "definite" defects, enlarged tonsils alone accounted for two-thirds of the whole, and nasal obstruction, with or without enlarged tonsils, for about one-quarter. Rhinitis was the chief other defect of this group. 8½ per cent. of the children examined were recommended to have operation for enlarged tonsils alone, and another 3½ per cent. for nasal obstruction with or without tonsils.

This high incidence of throat and nose defect is not peculiar to Willesden, but is made the subject of comment by various other Local Authorities.

Enlarged cervical glands correspond fairly closely in number to tonsil cases. Just over 29 per cent. had some degree of enlargement of these glands, and there were in all 31 per cent. with enlarged or septic tonsils.

It will be noted that there is much discrepancy between the percentage of children ascertained to be suffering from these two classes of defect in their pre-school life, and the percentage in whom the defects were found at medical inspection. It is apparent that these defects are allowed to develop almost unnoticed.

As regards the question of when they develop, the figures on this history sheet point to the fact that they may begin to show themselves at any time from infancy onwards. This is strictly in keeping with what is observed in those children (a small but fortunately a growing number), who report regularly for health supervision, and whose progress can be followed right up to school age.

The first thing to appear is rhinitis. This is often seen in infants of a month old, and may be quite severe and difficult to deal with however good the nasal hygiene employed. Breast feeding seems to make no difference. Later we have

symptoms of adenoids in some cases, and if their presence is verified and they are promptly removed, the nose condition usually clears up and there is also improvement in general health.

Enlargement of tonsils may be noticed at any time after the end of the first year, but is commoner from the third onwards. If, at the first sign of enlargement, these tonsils are kept under observation, it will be found that certain of them develop a chronic infection, evidenced not so much by their own continued enlargement as by a persistent palpability or more definite enlargement of the tonsillar glands, together with a commencing deterioration in the general condition of the child. This last is often very gradual and these are the cases that are apt to be missed if children are not re-examined frequently. Sometimes there are quiescent periods, varied by outbursts of infection, with increase in size of tonsils and glands. It is astonishing how seldom the average parent dreams of looking into the mouth of a child when it is ill, and such a one may be brought up during one of these recrudescences with tonsils almost meeting, glands heavily infected, and a history of repeated similar attacks, without the slightest suspicion on the part of the parent that the trouble lies in the throat.

A special history sheet was worked out for the different types of throat and nose defect, this confirmed the foregoing observations. Thus, no tonsil defects were noted in the first year, but they began to appear on the dossiers in the second, and the numbers steadily increased as the years passed. On the other hand, 3 per cent. of the "definite" throat and nose group had rhinitis or nasal obstruction during the first year of life.

Operations for the removal of tonsils and adenoids took place from the first year on, but the majority were in the fourth and fifth years. One important fact was that out of 68 children found at medical inspection to be suffering from rhinitis or mouth breathing (without tonsillar defect), there were 9 or 13 per cent. who had been previously operated upon. The operation had failed to clear up the nose condition or there had been recurrence. There is still a great lack of appreciation of the necessity for strict nasal hygiene and for regular supervision after these operations.

Of malnutrition cases proper, there were slightly over 2 per cent. As many as 24 per cent., however, or almost a quarter of the children examined, were judged to be only fairly well nourished. The proportion was higher among the girls.

In the first year of life 12·7 per cent. of all the children dealt with were noted to be defective in nutrition, the expressions used being such as "flabby and pale," "marasmic," "poor condition," "thin and badly nourished," "skin wrinkled," etc. In later years the percentages noted were one-half to one-third of this. Again it is obvious that the fact of this condition being present was overlooked in a large number of cases.

Lung conditions at medical inspection consisted mainly of bronchial catarrh, and this was usually temporary and accompanied by a cold. Frequently

there was a recent attack of measles or whooping cough to account for it. In the first year 20·7 per cent. had had lung defects. These were of no importance usually. The numbers were 6·1 per cent. for the second year and afterwards they corresponded to those found at medical inspection. A study of the individual dossiers showed recurrent or chronic lung defects to be very rare.

Digestive defects were frequent in the first year, and mainly consisted of diarrhoea and vomiting. After this they rapidly diminished and were 0·74 per cent. at medical inspection. There is no evidence that there was any failure to detect them in pre-school life.

With the exception of dental decay, in which the majority of cases were found for the first time at medical inspection, the same remark applies to the remaining groups of defect.

Mental defect that was at all noticeable would not come into this series. It would have been previously ascertained and dealt with under the Mental Deficiency Act. The 4·7 per cent. of children found at medical inspection were marked "dull," "slow," or "very backward," and these would be kept under observation before further classification was attempted. In none of them was there any previous record as to the mental capacity.

In Table VIII "other defects" accounts for most of the group of nervous defects, and includes enuresis, habit spasms, night terrors, excessive nervousness or shyness, uncontrolled temper, etc., a well-known group of functional derangements usually dependent on faulty environment. Hernias and phimosis accounted for many of the deformities noted as congenital.

In Table IX the main groups of defect found at medical inspection are separated out and compared in respect to certain points in the previous ascertained history. This comparison was carried out for all defects, and for all points in the history, but only in those selected did there appear to be anything worth recording.

*Ante-natal and neo-natal conditions.* One in twelve of all the mothers of these children was known to have attended an ante-natal clinic, and as between the groups there is no evidence to show that this made any difference in the condition of the child at its entry into school. This seems discouraging, but such evidence is more likely to be forthcoming in future studies of the entrant child. In the years 1920–21 ante-natal care was scarcely accepted, as it is now, by the mothers themselves, and attendance at an ante-natal centre often meant one, or perhaps two visits in order to book up for hospital, or to obtain other necessary benefits, and acceptance of the medical examination more as a fad of the doctor, or as a condition of obtaining these benefits, than because the mother herself saw any occasion for it, and only rarely the regular attendance and supervision of general health that is the rule nowadays. The impression gained now certainly is that the children born after this regular supervision, except in cases where there is some specially adverse circumstance which cannot be remedied, are very good specimens, and compare favourably with those where this element has been absent.

Table IX. Showing the relationship between certain points in the previous history, and the main types of defect found in 1604 Willesden entrants examined in 1926.

	All children dealt with	Children with no defects	With dental defect but no other defect	All with dental defect	With definite defects of throat and nose	With definitely enlarged cervical glands	With "fair" nutrition	With "poor" nutrition	With mental defect
	1604	226	255	940	125	238	390	35	68
	%	%	%	%	%	%	%	%	%
Mother attended an ante-natal clinic ... ..	8.41	7.07	8.62	9.2	6.58	6.3	9.48	8.57	8.8
Any abnormality noted in connection with pregnancy or confinement:									
Forceps delivery ... ..	12.34	18.14	11.76	10.1	11.29	13.44	10.76	2.85	5.8
Other conditions ... ..	5.11	3.98	4.7	5.5	4.7	6.3	2.56	2.85	4.4
Total ... ..	17.45	22.12	16.46	15.6	15.99	19.74	13.32	5.7	10.2
Children prematurely born ...	3.49	1.32	3.13	3.2	2.1	1.26	2.3	8.57	4.4
Had been operated on for removal of tonsils and adenoids	9.60	12.83	12.15	7.8	2.82	2.94	8.24	11.42	2.8
Defective nutrition noted during the first year of life ...	12.71	7.07	12.15	15.5	16.47	14.28	19.48	22.85	25.0
Digestive defects noted:									
During the 1st year ... ..	29.30	24.33	32.44	29.6	28.23	27.77	28.2	40.0	26.4
At medical inspection ... ..	0.74	0.0	0.0	0.5	0.23	0.0	2.05	5.71	0.0
Condition of the head as regards cleanliness at medical inspection:									
Nits found ... ..	8.10	2.21	8.23	8.08	11.05	13.02	8.46	17.14	10.2
Vermin found ... ..	1.12	0.88	0.31	0.9	0.47	0.84	1.53	0.0	2.9
Total "dirty" heads ... ..	9.22	3.09	8.54	8.98	11.52	13.86	9.99	17.14	13.1
% who had had these common infectious diseases prior to medical inspection:									
Measles ... ..	64.93	63.4	60.7	63.1	69.62	70.16	64.10	42.83	23.5
Whooping cough ... ..	44.8	46.87	44.69	42.7	43.96	42.42	38.71	42.83	17.6
Chicken pox ... ..	25.65	25.18	25.81	25.0	25.15	21.42	20.55	34.27	7.3
Mumps ... ..	9.16	11.93	8.62	8.6	10.1	10.5	8.24	8.56	1.4
Scarlet fever ... ..	3.85	3.08	1.56	4.3	5.15	5.46	4.61	2.85	1.4
Diphtheria ... ..	3.14	1.76	2.91	3.2	3.72	2.94	4.87	2.85	1.4
Pneumonia or broncho-pneumonia ... ..	7.01	4.85	9.40	7.2	6.81	7.56	8.97	14.26	4.4

Instrumental delivery had taken place in 12 per cent. of all the cases, and the highest proportion occurred in the "no defect" group, which however had a low proportion of other abnormal conditions. Again, taking all the groups, there is no evidence of effect on the child from such conditions. In the case of prematurity, the percentage of 8.5 among children with poor nutrition is very high compared with the average for the whole group, and may have some significance in spite of the smallness of the numbers dealt with.

*Attention to throat and nose defects.* Here over 12 per cent. of the "no defect" groups had been operated on as compared with 9.6 per cent. for all the children, but the figures for the children with throat and nose defects at medical inspection clearly show that having had this operation does not guarantee entire freedom from such defects at school entry.

*Nutrition and digestion.* In regard to nutrition the contrast between the low percentage of children in the "no defect" group who had appeared defective in this at the beginning of life, and the high percentage in both of the "defective

nutrition" groups, is striking, and seems to indicate that however imperfectly recorded, this defect shows itself early in life in many cases. It will be noted also that the highest percentage of all, in this comparison, is among the children who at entry to school were defective, or appeared to be defective in mental capacity.

Digestive defects are shown to be higher at medical inspection in both the "defective nutrition" groups and especially high in the first year among those with "poor" nutrition. In the two groups of children without any general defect, but in whom the one set had defective teeth and the other had sound teeth, it may have some significance that the percentage of digestive trouble during the first year of life is so much higher in those whose teeth were later found decayed.

*Cleanliness of head.* The high standard here among children with no defect, may mean either better material conditions, or a better quality in the mother.

*Common infectious diseases of childhood.* There is some evidence, bearing out one's ordinary observation, that measles and scarlet fever tend to leave behind them defects of the throat and nose. Apart from this, with the exception of diphtheria and pneumonia, the fact of having had these diseases does not seem to seriously affect the health of the school entrant.

The data of Table IX can be handled in another way which throws light upon the question whether the differences in the percentages of that table are so great as to be unlikely to have arisen through mere fortuitous variations. Thus, passing from percentages to actual numbers, we can construct a series of such tables as the following:

*Attendance of mother at ante-natal clinic.*

	+	-	Totals
Defects in children present	119	1259	1378
"    "    "    absent	16	210	226
	135	1469	1604

Which is to be read: 16 of the children of mothers who had attended ante-natal clinics (135) were free from defect; 210 of the children of mothers who did not so attend (1469) were free from defect, etc. The material being so arranged, we ask what is the probability that the divergence between the ratios 16 : 135 and 210 : 1469 might have arisen by mere chance sampling of a "population" within which the ratios were equal, *i.e.* that attendance or non-attendance of mothers was not correlated with the frequency of defects in their children? Using the appropriate method we find that such a divergence would occur, in the long run, in some 43 per cent. of trials. In other words, there is no reason to suppose that the events here in question *are* correlated.

This method has been applied to the 24 most important groupings of Table IX. If now we take, as a more or less arbitrary limit of significance, a probability of one in ten, *i.e.* if we take it that discrepancies from expectation which would only occur once in ten times, or *less* often than once in ten times, as mere chance events, are *not* chance events, we conclude that the following are significant results.



The relation :

- (1) Between presence or absence of defects and natural or artificial (forceps) delivery.
- (2) Between nutrition in the first year and incidence of defects.
- (3) Between nutrition in the first and in subsequent years.
- (4) Between digestive defects in the first year and later defects.
- (5) Between abnormality in pregnancy or confinement and poor nutrition of children.
- (6) Between "dirty heads" and defects.
- (7) Between measles and nose and throat defects.
- (8) Between measles and enlarged cervical glands.
- (9) Between scarlet fever and throat and nose defects.

#### SUMMARY.

Summarising the results of this investigation, those set out in the first part of the paper are, on the whole, very gratifying. Making due allowances for difficulties of comparison, there is little doubt that entrants now are in a better condition than they were twenty years ago. The characters, *e.g.* general nutrition and state of teeth, for which there has been no improvement or actually a set back in recent years are those which might be expected to have been influenced by transitory conditions due to the war and are also those the measurement of which most closely depends upon the standard adopted; this standard has probably risen.

In the second part of the paper, I have shown that there is an intimate relation between various defects which develop before, sometimes long before, school age and defects or disabilities which are of grave importance during school life. How far one is dealing with environmental effects and how far with inborn weaknesses cannot, of course, be ascertained without further data; but it is clear that the care of the child before admission to school is a matter deserving as much attention as possible, even with respect to shortcomings often attributed to factors only coming into play during school age.

I desire to make grateful acknowledgement of the valuable help received from Professor Major Greenwood of the London School of Hygiene and Tropical Medicine, who has not only revised and corrected the whole manuscript but has definitely contributed to it in respect of the introduction, the mortality percentages set out in Table IV, and of the statistical analysis of Table IX.

(*MS. received for publication 4. I. 1930.—Ed.*)