

DENTAL STRUCTURE AND CARIES IN 5-YEAR-OLD CHILDREN ATTENDING LONDON COUNTY COUNCIL SCHOOLS

RESULTS OF FIVE SURVEYS (1929-49)

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In 1929, at the request of the Board of Education, the teeth of 5-year-old children attending L.C.C. schools were examined. Fourteen years later a similar survey was undertaken, with the idea of seeing whether there had been any improvement or deterioration in this period (Mellanby and Coumoulos, 1944). It was then decided to make a series of two-yearly inspections, using the same criteria, and the latest of these was made in 1949. The object of the present paper is to summarize the most recent findings and to compare them with those of the previous surveys.

In the earlier work it was shown that the dental condition of this age group, as regards both structure and caries, had improved from 1929 to 1947 (Mellanby and Mellanby, 1948). Since we made no examinations between 1929 and 1943, it is not possible to say at what rate the improvement took place or whether it was regular during that period, but there is no doubt that it was very definite and significant (Mellanby and Coumoulos, 1944). Many more children had teeth with good structure in 1943 than in 1929, and the percentage of caries-free plus almost caries-free children rose from 4.7 to 24.2 during the 14 years. In 1945 the percentage in this latter category was 28.1, while in 1947 it had risen to 37.5. It was therefore with great interest that the 1949 survey was made.

As it was realized that it would not be possible to examine as many children in 1949 as in 1943 and 1947—namely, 1,870 and 1,590 respectively—it was decided to limit the number to approximately that of 1945, when 691 children were seen. So far as possible the same schools were visited as in that year, but, since there were many more 5-year-old children on the registers, a random sampling method was used to obtain the requisite number. Six hundred and ninety-two children were examined; their

average age was 5 years 6 months—one month older than the average for each of the previous three surveys.

The inspections were conducted in the same way and according to the same standards as before (Mellanby and Coumoulos, 1946; Mellanby and Mellanby, 1948).

To get some indication of the extent of the lesions, apart from the percentage of carious teeth, a number (1, 2, or 3) was allotted to each carious tooth, according to the severity of the disease (Mellanby and Coumoulos, 1946). The total so obtained for any group of teeth was then divided by the number in the group, thus giving the average caries figure (A.C.F.). The greater the number of teeth with little or no caries the lower the A.C.F. A similar principle was adopted in order to assess the extent of M-hypoplasia (A.H.F.), the number 1 being given for M-Hy₁, 2 for M-Hy₂, and 3 for M-Hy₃. The few teeth showing gross and unclassified hypoplasia were excluded from these calculations.

As in the other investigations of this series, any missing incisors were assumed to have been shed. Very few of the 13.3% of missing lower incisors would have been carious, and as only 5.2% of the upper were absent any decayed among them would have made little difference to the caries total. Missing canines (0.2%) and molars (upper 6%; lower 13.4%) would have been extracted at this age and were therefore included in the severe caries (C₃) category.

As many workers now use the D.M.F. (decayed, missing, and filled) method of expressing their results, we have added the corresponding nomenclature as subheadings where applicable (see Tables II and III).

In order to reduce the size of the tables for this paper, the four grades of structure (Hy₀ to M-Hy₃) given individually in previous papers have been combined into two categories, as have the four grades previously given when assessing caries (C₀ to C₃).

Results

From the tables it can be seen at a glance that the gradual improvement in the dental condition previously noted was not maintained. There was indeed a falling off in 1949.

Structure.—It is clear from Table I that there were fewer well-formed teeth in 1949 than in the previous survey; 79.8% of all teeth were graded as Hy₀ or M-Hy₁ in 1949 as compared with 84.5% in 1947, but there were more, on the average, than in 1945, when 71.6% came into this category. The percentage of some individual types

TABLE I.—Tooth Structure in 5-year-old London Children

Type of Tooth	Total No. of Teeth Examined for Structure				Percentage of Teeth with Good or Fairly Good Structure (Hy ₀ +M-Hy ₁)				Percentage of Teeth with Poor Structure (M-Hy ₂ +3)				Percentage of Teeth with Gross or "Textbook" Hypoplasia (G-Hy)				Extent of M-hypoplasia (A.H.F.)			
	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949
Upper jaw:																				
Central incisors	3,324	1,262	2,931	1,230	52.1	61.2	82.8	79.1	43.7	32.1	14.2	18.6	3.9	6.6	3.0	2.3	1.37	1.14	0.68	0.83
Lateral incisors	3,465	1,341	3,023	1,308	74.1	78.0	88.6	89.3	23.1	16.5	8.2	8.6	2.5	5.4	2.7	2.1	1.00	0.79	0.61	0.73
Canines	3,707	1,369	3,119	1,365	83.3	86.5	93.6	93.8	14.7	11.2	4.4	6.1	1.0	1.1	0.7	0.2	1.83	1.71	0.59	0.70
1st molars	3,268	1,282	2,869	1,246	40.3	47.9	64.7	58.2	56.9	49.3	34.9	43.1	2.8	2.8	0.4	0.6	1.57	1.48	1.28	1.41
2nd molars	3,427	1,342	2,960	1,307	35.2	44.7	53.8	46.2	63.4	54.3	46.1	53.4	1.3	1.0	0.1	0.2	1.68	1.58	1.44	1.54
Lower jaw:																				
Central incisors	3,091	1,097	2,535	1,044	95.9	99.1	99.6	99.4	3.8	0.4	0.3	0.2	0.2	0.5	0.2	0.4	0.33	0.15	0.06	0.13
Lateral incisors	3,624	1,348	3,097	1,333	95.2	98.7	99.4	99.7	4.6	0.8	0.5	0.1	0.1	0.3	0.2	0.2	0.43	0.21	0.10	0.42
Canines	3,702	1,370	3,109	1,372	88.8	93.2	96.3	96.9	6.4	2.4	0.7	1.7	1.4	0.7	0.3	0.0	0.53	0.30	0.19	0.57
1st molars	3,119	1,235	2,700	1,172	56.9	61.9	87.8	82.9	40.5	35.6	11.8	38.3	2.5	2.6	0.3	0.8	1.27	1.17	0.77	1.24
2nd molars	3,104	1,241	2,755	1,171	41.6	45.0	77.8	72.8	54.9	53.5	21.9	26.7	3.4	1.5	0.3	0.4	1.56	1.55	1.02	1.18
Total	33,831	12,887	29,098	12,548	67.0	71.6	84.5	79.8	30.5	25.5	14.2	19.4	1.9	2.3	0.8	0.7	1.04	0.91	0.67	0.88

A few of the teeth included in the column headed "Total No. of Teeth Examined for Structure" could not be classified into any of the grades shown in this table. Therefore the percentages do not add up to 100 in all instances.

of teeth in the better-structure group was as high or nearly as high as in the best year so far recorded (1947). The average hypoplasia figures (A.H.F.) for all types of teeth are given in the last column of Table I. Only a small amount of gross hypoplasia was found in any of the surveys, the latest figure being about the same as that obtained in 1947.

Caries.—From the figures given in Table II it is seen that 1947 was the year in which there was the greatest

TABLE II.—Caries-free Children and Caries-free Teeth Among London 5-year-olds

Year	Children			Teeth	
	Total No. Examined	% Caries-free (i.e., with no D.M.F. Teeth)	% Caries-free + Those Almost Caries-free	Total No. of Teeth	Percentage Caries-free
1929	1,293	*	4.7		
1943	1,870	14.9	24.2	36,196	69.9
1945	691	24.2	28.1	13,381	73.5
1947	1,590	28.1	37.5	30,839	79.7
1949	692	14.9	24.9	13,328	73.3

* The percentage of caries-free children at this time was negligible.

percentage of children free from caries—namely, 28.1%. In 1949, as in 1943, only 14.9% were in this category. The proportion of caries-free teeth, however, was higher in 1949 (73.3%) than in 1943 (69.9%), though not as high as in 1947 (79.9%); it was, in fact, the same as in 1945, when it was 73.5%. The distribution of caries among

was again observed in 1949, as in the previous surveys of this series and in the earlier investigations of the authors and of other workers (M. Mellanby, 1923, 1927, 1934; Deverall, 1936; Davies, 1939; King, 1940; H. Mellanby, 1940), that the teeth of poorer structure, as judged by the degree of M-hypoplasia, were more prone to decay than were those which were better formed.

Summary

The main findings in a series of dental surveys among 5-year-old children attending public elementary schools in the London County Council area have been given; the results of the last four surveys made at intervals of approximately two years are, for the reasons stated earlier (Mellanby and Mellanby, 1948), set out in more detail than those of the original survey of 1929, on which the others were based.

At the time of the fifth and latest survey of 1949 proportionately fewer children were caries-free—namely, 14.9%—than on the two previous occasions, when the figures were 28.1 and 24.2% respectively; the position had, in fact, reverted to that of 1943. In 1929 the number of children so classed was negligible.

The percentage of caries-free teeth (73.3) had not fallen in 1949 to the same extent relatively as the percentage of caries-free-children, but was comparable to the figure obtained in the third survey made in 1945 (73.5%). Dental structure, on the other hand, although not in general as good as in 1947, was better than in 1945.

It is difficult at present to suggest a reason for this apparent lapse between 1947 and 1949, following the previously observed improvement in the dental condition of children of the same

TABLE III.—Caries Incidence and Extent in 5-year-old London Children

Type of Tooth	Total No. of Teeth				Percentage of Teeth Free From or with only Slight Caries (C ₀ +C ₁)				Percentage of Teeth with Definite Carious Cavities (C ₂ +C ₃)				Percentage Carious Teeth (i.e., D.M.F. per 100 Teeth)				Extent of Caries (A.C.F.)				
	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949	
Upper jaw:																					
Central incisors	3,392	1,280	2,974	1,274	72.2	75.5	83.4	79.2	27.8	24.5	16.5	20.7	37.6	29.5	22.2	30.1	0.77	0.61	0.42	0.56	
Lateral incisors	3,590	1,358	3,095	1,351	86.5	88.3	92.7	90.0	13.5	11.7	7.3	10.0	20.3	14.9	10.6	14.5	0.38	0.30	0.20	0.28	
Canines ..	3,740	1,381	3,180	1,384	93.4	94.2	95.0	93.1	6.6	5.8	5.1	6.8	9.5	7.5	6.9	9.1	0.18	0.15	0.13	0.17	
1st molars ..	3,740	1,382	3,180	1,384	66.7	69.4	75.9	71.2	33.3	30.6	24.2	28.9	42.0	38.9	30.6	35.7	0.95	0.83	0.65	0.78	
2nd molars ..	3,740	1,382	3,180	1,384	60.7	66.3	79.6	74.2	39.2	33.7	20.4	25.9	56.5	51.4	34.4	44.2	1.17	0.95	0.64	0.79	
Lower jaw:																					
Central incisors	3,112	1,098	2,576	1,061	97.8	99.2	99.0	98.9	2.2	0.8	0.9	1.1	4.9	1.7	1.7	3.3	0.08	0.03	0.03	0.05	
Lateral incisors	3,662	1,354	3,114	1,338	98.3	98.5	98.8	98.1	1.7	1.5	1.1	1.9	3.7	2.1	1.7	2.6	0.06	0.04	0.03	0.05	
Canines ..	3,740	1,382	3,180	1,384	95.5	94.8	97.3	96.4	4.5	5.2	2.7	3.6	6.9	5.9	4.1	5.5	0.13	0.12	0.07	0.10	
1st molars ..	3,740	1,382	3,180	1,384	53.9	58.6	62.4	55.5	46.1	41.4	37.6	44.5	54.0	48.6	43.3	54.0	1.29	1.10	1.00	1.22	
2nd molars ..	3,740	1,382	3,180	1,384	51.9	56.3	68.2	57.8	48.1	43.6	31.7	42.2	61.0	58.8	43.0	61.3	1.42	1.27	0.95	1.29	
Total ..	36,196	13,381	30,839	13,328	77.3	79.7	84.9	80.9	22.7	20.3	15.1	19.1	30.1	26.5	20.3	26.7	0.65	0.55	0.42	0.54	

the various types of teeth is seen in Table III. Though the 1949 results were in general very similar to those of 1945, more decay was found in the lower molars and less in the upper. The percentage of carious lower first and second molars increased from 48.6 and 58.8 to 54.0 and 61.3 respectively, and the carious upper molars were reduced from 38.9 and 51.4 to 35.7 and 44.2% respectively. The A.C.F. for all types of teeth are given in the end column of Table III.

Structure and Caries.—Table IV shows the relationship between structure and caries in the last four surveys. It

age group; it may represent merely a periodic fluctuation, or it may mark the beginning of a progressive deterioration. It is hoped to make a sixth survey in 1951, when it will be seen how the trend has resolved itself. Discussion of the possible factors influencing the results should then be more profitable.

We wish to acknowledge our indebtedness to Sir Allen Daley and the London County Council for permission to carry out the inspections; to the head teachers and staffs of the schools for their willing co-operation in the scheme; to Mrs. M. Kelley and Mrs. J. Joyner for their assistance in connexion with the preparation of the report; and to Miss I. Allen, of the Medical Research Council's Statistical Department, for help and advice.

TABLE IV.—Percentage Incidence of Caries in Teeth with Varying Grades of Structure in 5-year-old London Children

Structure of Teeth	Percentage Carious											
	Incisors				Canines				Molars			
	1943	1945	1947	1949	1943	1945	1947	1949	1943	1945	1947	1949
Good or fairly good (Hy ₀ +M-Hy ₁) ..	5.9	4.5	6.1	9.8	4.8	3.8	4.3	5.8	20.8	21.1	26.2	36.4
Poor (M-Hy ₂ + ₃) ..	51.7	46.0	37.5	32.3	30.1	33.0	14.2	22.4	65.6	70.0	44.2	50.9
Gross hypoplasia ..	64.2	62.4	36.0	39.7	23.3	20.8	34.4	—	58.9	52.5	34.4	36.0

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CANCER OF THE BREAST TREATED BY OOPHORECTOMY

BY

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The treatment of advanced cancer remains an important problem, and any encouragement we gain in an endeavour to help these patients should be made known so that others may benefit. The case record is therefore presented of a patient with advanced cancer of the breast who was treated solely by bilateral oophorectomy; the disease disappeared entirely during the six months following the operation, and she was free from demonstrable disease 22 months later. This patient called attention to the fact that the various lumps increased in size immediately before menstruation, and it was this observation which made me decide to perform the operation. The experience of others has been sought in the literature and is presented to enable an assessment to be made of the present position in order to plan for a further step forward.

Case Report

A married woman, aged 50, with two children, was seen on April 13, 1948, with multiple lumps.

History.—Two years previously she noticed a swelling of the right side of the face in the region of the parotid salivary gland and pre-auricular lymph nodes. In July, 1947, a small painless lump, which increased in size, appeared above the inner end of the left clavicle. In December, 1947, she noticed a large lump in the left breast and a small lump on the outer aspect of the left arm. Other similar nodules developed in the skin over the right shoulder, chest wall, and right loin. These lumps varied in size with the menstrual cycle, being largest just before menstruation began. Her general health was good; there was no loss of weight.

Menstrual History.—Menstruation started at the age of 16; the cycle varied from 21 to 26 days; the duration of period was 7 to 8 days. During the past two years she has lost clots.

Examination.—Her general condition was good and no abnormality was detected. A nodular lump 3.4 by 2.2 cm. was seen in the right parotid region. In the left supraclavicular region a hard irregular swelling 5 by 2.5 cm. was found. There was no abnormality in the right breast. A hard irregular lump 3.5 cm. in diameter was found in the upper and inner quadrant of the left breast, attached to overlying skin and somewhat tethered to underlying structures. Hard fixed lymph nodes were present in the left axilla. In the right axilla there were no enlarged lymph nodes. Multiple nodules were seen in the skin over the right shoulder, left arm, chest wall, and right loin. The abdomen was normal. Radiological examination of the chest, dorsal and lumbar spine, and pelvic bones revealed no metastases. A blood count showed: red cells, 4,080,000 per c.mm.; white cells, 6,400 per c.mm.; Hb, 78%; C.I., 0.98;

anisocytosis was rather marked; leucocytes appeared normal (Figs. 1A to 2B illustrate the case.)

Operation.—On July 7, 1948, a bilateral oophorectomy was performed and the skin nodule from the right shoulder region was excised.

Pathologist's Report on Specimens.—“(a) Both ovaries:—There is an enlargement of one ovary by a cyst with water contents (2.5 by 2 cm.); the other ovary appears normal. Microscopy shows that the ovarian cyst has a thin lining of luteal cells. In the other ovary there is a wide, ill-defined zone of theca-cell formation; otherwise there is no abnormality. (b) An elliptical piece of non-ulcerated skin (2.2 by 1 cm.) with underlying fat (1.2 cm. deep) in which there is a firm white growth merging into the dermis and projecting on one part of the cut surface. Microscopy reveals a secondary spheroidal-cell carcinoma arranged as compact groups, narrow cords, and isolated cells in the subcutis and deep layers of the dermis.”



FIG. 1A.—Tumour in right pre-auricular region. Before bilateral oophorectomy.



FIG. 1B.—Tumour in right pre-auricular region has disappeared after bilateral oophorectomy.



FIG. 2A.—Skin nodule below left clavicle. Before bilateral oophorectomy.

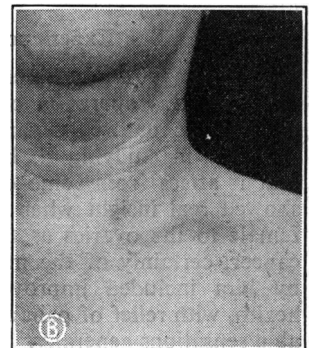


FIG. 2B.—Skin nodule below left clavicle has disappeared after bilateral oophorectomy.

Subsequent Progress.—On August 17 the lumps were smaller; and some skin nodules had disappeared. On October 26 the swelling in the right parotid region had practically disappeared; the lump in the left breast was very soft, 2.5 cm. in diameter. On January 25, 1949, there was a residual area of slight thickening at the site of the original tumour in the left breast, a small lymph node in the left axilla, and an area of thickening in skin of the left arm. On February 22 all lumps had disappeared; the tissues of the left breast were soft and pliable and resembled a normal breast; there were no enlarged lymph nodes in the left axilla; the face was normal; and all the skin nodules had disappeared. On May 23, 1950, the patient was well, with no sign of carcinoma.

Historical Basis

As long ago as 1896 a new treatment was introduced for advanced cancer of the breast by G. T. Beatson, of Glasgow. The patient was referred to him by Dr. J. W.