

Report of the committee ... of the British Dental Association to conduct the collective investigation as to the condition of the teeth of school children.

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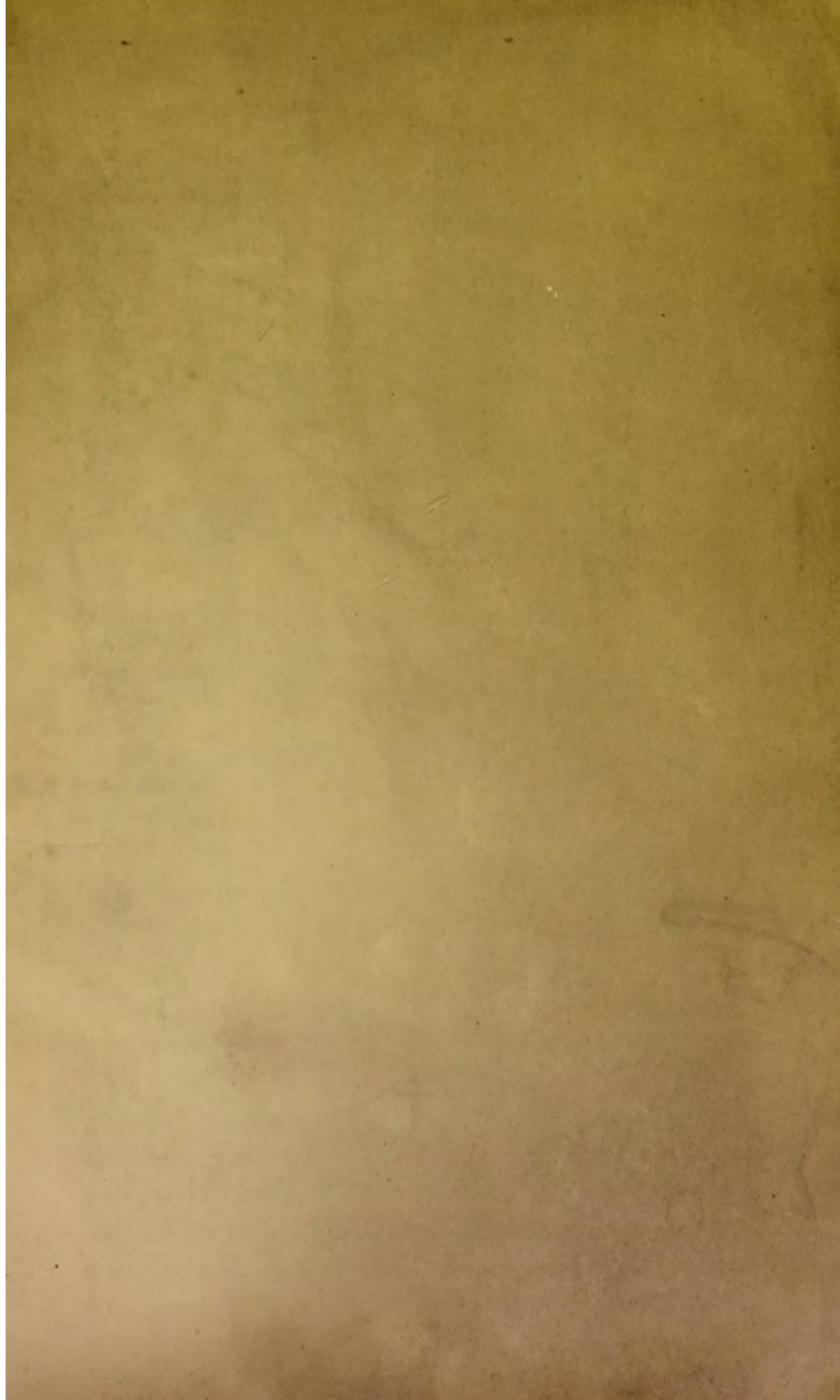
REPRINT of the
SEVEN REPORTS of
the Committee appointed
by the *Representative*
Board of the
BRITISH DENTAL
ASSOCIATION to
conduct the
Collective Investigation
as to the *Condition*
of the TEETH of
SCHOOL CHILDREN

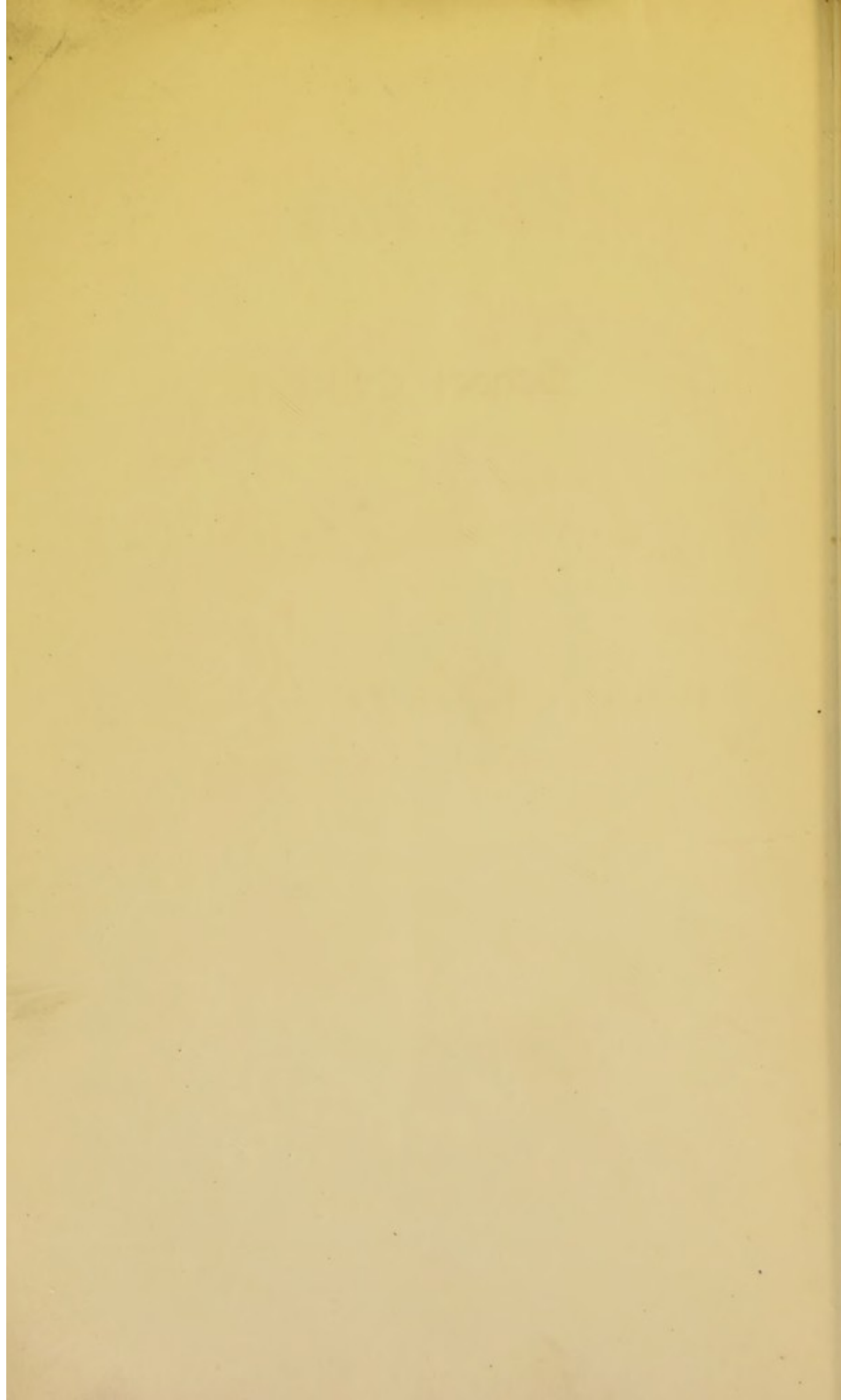
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FIRST REPORT

OF THE

School Committee

OF THE

BRITISH DENTAL ASSOCIATION

ON THE

CONDITION OF THE TEETH OF
SCHOOL CHILDREN.

London:

JOHN BALE & SONS,

87-89, GREAT TITCHFIELD STREET, OXFORD STREET, W.

—
1891.

REPORT

COMMISSION

ON THE

STATE OF

THE

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First Report

*Of the Committee Appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

THE British Dental Association is convinced that if more attention were paid to the teeth of children the general sum of public health and well-being would be materially increased, inasmuch as the disastrous effects frequently produced even in early adult life by the decay and loss of teeth may, in a very large majority of cases, be traced to disease of those organs in childhood. It is, for example, a well-known fact that a large percentage of the young men declared as being unfit for naval and military service are rejected solely on the ground of dental disease such as might with ease have been prevented by a comparatively small amount of proper attention at an earlier age.

The Association felt that it was necessary to show, by means of reliable statistics, the amount of dental disease existing amongst children, and thereby to demonstrate the necessity of some adequate provision being made to meet the evil, and also to provide sufficient data which would convince those in authority that in giving attention to these matters they would be acting in the interests of the public at large, as well as in those of the children themselves.

The examination of the teeth of school children in a number of schools (mainly reformatories, industrial schools, orphanages,

national and board schools, and the like) throughout the country is now being conducted by dental practitioners approved of by the British Dental Association, in order to obtain statistics for the following purposes:—

1. To acquire a more exact knowledge of the condition of children's teeth at various ages.

2. To show, by means of the facts thus acquired, the disabilities under which children frequently suffer in their growth and development, and the important bearing this condition has upon the future health of the individual.

This important investigation demands for its completion a much longer period of time than has yet elapsed since its initiation. The returns made show results which, though necessarily somewhat imperfect, are yet of considerable value, inasmuch as they serve to prove what has hitherto been only a well-grounded impression, or at most a carefully considered conviction, that dental caries is one of the most widely prevalent diseases of childhood.*

It is important to note that this statistical information is not only, so far as it goes, of a reliable nature, but is derived, not from the practice of dental surgeons or special hospitals, but from the inspection of industrial schools, training ships, and other scholastic institutions, and may be taken as typical of the condition of the teeth of the poorer classes both in England and Scotland, since healthy teeth and mouths have been as carefully tabulated as the unhealthy.

It must not be supposed that the state of affairs revealed by these statistics is confined to the lower classes. An examination has only been made of one school, consisting of the children of well-to-do or middle-class parents, and although the number of pupils is unfortunately too small to give a thoroughly reliable ratio, it is not without interest that it holds, at least provisionally, the distinction of presenting the highest percentage of carious and defective teeth requiring attention. †

Your Committee is strongly of opinion that it would be desirable to carry out in the future inspections of a sufficient number of schools

* Some of the later returns, which are almost perfect, only intensify the above statement.

† Later returns include one or two better-class schools, but these have not yet been classified.

of a totally different class in order to contrast them with schools which may be classed under the category of Industrial Schools.

Your Committee also anticipate that this First Report, which they readily admit is far from exhibiting the full value of this statistical information, will serve the purpose of calling attention both of the public and the dental profession to a work which is of public utility, in such a way that it should command both their and your active co-operation in extending the scope of the present investigation, so that finally it may be representative of the whole community.

Previous to the publication of our case books, the American Dental Association had undertaken a somewhat similar investigation, with the intention of collecting the results of the examination of 100,000 teeth, which was regarded as sufficient to give reliable data on which to base conclusions. It is evident that the results of two such investigations, conducted in two countries which differ so materially as to diet, out-door exercise and habits, must increase the interest of our mutual work.

In a certain number of schools and other institutions examined, it was found that there were several children between the age of two and five years; the inclusion of such examinations greatly upsets any averages which may be deduced, and it was deemed better to form a separate tabulation comprising infants only. The small number of infants under two years have been included in a separate table (Appendix A).

Infants.—The number of infants examined is at present only sufficient to be somewhat indicative of the conditions which may be anticipated. The figures seem to prove the following points; firstly, that a considerable number of teeth are decayed as early as the second and third years, and secondly, that the number of decayed teeth increases as age advances, and thirdly, that the proportion of infants having a denture free from caries at the age of five years is about 26 per cent. (Appendix B1).

A more extended inspection of the dentition of infants would be extremely valuable. A recent examination of 186 infants in two day schools, near Leeds, shows a much worse state of affairs, only 1.6 per cent. being perfect dentures, while the total number of carious teeth was 888 per cent. In some cases under both tables the child had not one sound tooth in his head. A comparison of this table (Appendix B2), with that immediately preceding, in which, from the number examined being ninety-eight, the actual totals may be taken as the ratio per cent., is so striking

that it is deemed better to await returns from other districts before attempting to deduce a general average.

For the purposes of tabulation an infant is defined as a child who has not erupted any teeth belonging to the permanent set. This definition will therefore include a very considerable majority of children in their fifth year, and a relatively much smaller proportion in their sixth and seventh years.

Number of Children.—The number of children, exclusive of infants, on which we have to report is 4,062, consisting of 2,661 males and 1,401 females, ranging in age from five to nineteen years, mostly between eight and fifteen years; the average age is shown in the annexed table (Appendix D1), according to sex, nationality, and in the aggregate.

The importance as well as the difficulty of this investigation may be grasped from the single fact that it has involved the systematic investigation of over 100,000 teeth. It will be readily understood that such an investigation, carried out from a printed code of instructions, by examiners who have hitherto had no opportunity of conferring with the Committee, must include many errors which are capable of being rectified in future reports. What has been deemed of importance in one case by one examiner has evidently been deemed unimportant by others. This is most apparent in the returns of a certain number of schools where the disease affecting the temporary teeth has either not been recorded at all or with anything like the same exactness as that affecting permanent teeth, probably not from any disregard of the importance of these teeth, but simply because so many of them would naturally be lost at a not distant period of time and did not, in the opinion of the examiner, imperatively demand immediate treatment. The consequence of this is that when we aggregate the returns with regard to temporary teeth, the number of teeth requiring extraction and those requiring filling seems quite ridiculous to a dental practitioner when he remembers the relatively enormous total of teeth which are, or should be, present.*

Your Committee have felt that it would be better to calculate the ratio of the temporary teeth, defective, absent, or requiring extraction as related to the total number of temporary teeth present; this has been impossible, and they have deemed it better to base it for the present on the number of mouths examined.

* Later and better returns, now embodied in the tables, have greatly improved the returns in this respect.

The total of age has been prepared, and later on it is proposed to correct the present ratios as related, say, to the aggregate number of children below the eleventh year.*

Meanwhile they have to report that the first entry on the general tables (Appendices C₁, C₂ and C₃) which show the general results of the investigation in the aggregate, classified as to sex and English and Scotch Schools—(a) Temporary teeth requiring filling—is utterly unreliable as being taken to represent the number of teeth requiring treatment, and merely shows that in certain schools certain examiners deemed these teeth as urgent for immediate filling with a view to their retention until their natural removal during the eruptive period, while others have ignored the presence of the chart of the temporary teeth entirely. The entry under (b)—Temporary teeth requiring extraction—is much more reliable; for all practical purposes, however, your Committee think that the total of (a) and (b) may be taken as a fair expression of the minimal amount of professional attention required for the children examined.

The influence of sex is not immediately apparent, though whether more than the mere approximation of the relativity has been attained is still problematical.

Permanent and Carious Teeth.—The number of permanent and carious teeth has been classified under three heads—teeth requiring filling and therefore savable; the number of teeth already lost; and the number of teeth requiring extraction—which show that the total number of teeth affected with caries amounted in the aggregate to males 7032, females 3298, total 10,330, thus showing a ratio per thousand children of males 2642, females 2355, total 2543.

A careful consideration of the relations of the antagonising teeth shows that the smallest fractional part of the denture which can be possibly entertained in any discussion as to the proper radical treatment of the normal denture is either a pair of teeth or a set of four. Only where the irregularity is not symmetrical, or if symmetrical where some appliance will be inserted for effectually closing the space, or where the age of the patient precludes the reasonable anticipation of any subsequent rectification of the loss, can it be asserted that radical treatment by the loss of a single tooth is applicable. The subsequent movement of the teeth which results from judiciously applied symmetrical extraction is such that sometimes even an expert may be in doubt as to whether, say such teeth as the first molars, have ever been extracted or not.

* This has been partly done in Appendix D₂.

In order to provide for the beneficent results of such treatment, and to produce uniformity of practice in this, it is calculated that an additional number of 878 teeth, *i.e.*, 215 per 1000, might be sacrificed with advantage to individuals.

It was also found that a certain number of permanent teeth had not been erupted, and judging from the long period which has elapsed from the time when they should have been so, it was considered very improbable that they would be erupted at any subsequent period. Such teeth amounted to 150 (males 115, females 35), or ratios respectively of 37 (43 and 25), per 1000.

It will be readily admitted that it is an extremely difficult question to decide whether a tooth which has not yet been erupted should or should not be placed in this category. It is, however, evident that even the probable absence of even a few teeth must be regarded as a factor in estimating the relative efficiency or perfection of the denture. It has been deemed wise to take a broad view as to the probabilities, and, as it were, giving the absent teeth the benefit of the doubt, and it is hoped that you will either approve of the present tabulation or show good cause for its alteration by the production of satisfactory evidence to the contrary. In order to facilitate criticism on this point the following cases have been selected as typical of what has been considered for tabulation purposes as teeth probably permanently absent.

Illustrative Cases.

Absence of laterals at ages varying from twelve and a half to sixteen years.

Absence of left upper second molar and right upper second bicuspid at eighteen and a quarter years.

In dealing with the large number of teeth examined the number of defective teeth may seem surprisingly small, and it must be admitted that the ratio of defective teeth per 1,000 children fails to convey a sufficient measure of the prevalence of decayed teeth, even when we make a liberal allowance for the fact that the majority of the teeth have been recently erupted, and have therefore not been long exposed to the action of the agents producing caries. A much more reliable method of measurement is a tabulation of the number of perfect dentures come across in the course of the examination. For the purposes of tabulation a perfect

denture has been regarded as one in which the dentition, as far as the second molars, was complete and free from caries. With a view of not unnecessarily burdening the statistical returns for our immediate purposes by differentiation of the following factors, neither a dirty condition of the mouth, nor deposits of tartar, nor even of some scattered remnants of temporary teeth, nor any irregularity or crowding, have prevented dentures complete for the age attained, and free from caries, being entered under this head. The majority of them did not include these vitiating elements.

Complete Permanent Perfect Dentures.—The total number of completely erupted permanent dentures which may be regarded as perfect, that is, no caries being present, and therefore requiring no fillings or extraction was only 215 (males 164, females 51), representing a ratio per thousand strength, *i.e.*, the number of children over eleven years, which was respectively 109 (males 111, females 103).

It was apparent, however, from certain of the returns, that occasionally a child had a full complement of twenty-eight teeth as early as the eleventh year. In order therefore to correct as far as possible this apparent line of demarcation between what we may be allowed to term the eruptive period, namely, from five to eleven years, and the period of completed eruption, that is, after the eleventh year occasionally, though after the twelfth year usually, the number of children in their eleventh year as well as the number of perfect dentures has been included in the totals of both divisions in calculating the ratio per thousand.

In estimating the total number of "perfect" dentures it was found difficult to give any absolutely accurate return of those cases requiring no professional assistance during what we may term the eruptive period, owing to the presence of both temporary and permanent teeth, more especially from the fact that caries of the temporary teeth was not always indicated on the charts. It is, however, worth noting that in the column of remarks "perfect" was placed opposite to certain cases during the eruptive period, which neither required filling or extraction. As far as possible all the returns have been revised so as to place all the dentures during this period amongst the perfect considered in the age column. The number of dentures thus marked as "eruptive perfects," out of the total number of children under twelve years, amounted in the aggregate to 104 (males 66, females 38), thus representing ratios per thousand of 55 (males 64, females 45).

Retarded Eruption and Undue Retention.—Under the heading of retarded eruption or undue retention have been noted, for instance, such clear cases as the following :—Child aged fourteen, upper temporary lateral incisors still persisting, permanent laterals in consequence both irregular; and child aged twelve years and nine months, right upper permanent lateral incisor shutting within the arch of the lower teeth in consequence of the retained temporary lateral incisor. The total of such cases, not always so clear, however, as those just instanced, was 465 (males 250, females 215), representing a ratio per thousand of 114 (males 94, females 153). This class of cases serves clearly to explain how a large number of irregularities of the permanent teeth occur, which are obviously of a preventable nature, since irregularities have long been recognised as a predisposing cause of caries, and therefore the importance of the tabulation under this column cannot well be exaggerated. It may lead to some reliable conclusion as to whether or not it is better to extract temporary teeth if the normal period for their removal by natural means has passed, although there may be no immediate signs of the appearance of the successional teeth. Although this matter may still remain a problem for the dental profession, this column, even taken alone, proves very conclusively the necessity for efficient dental supervision of the mouths of all children during this critical eruptive period, and for a few years afterwards—in fact for the whole normal period of school life.

The total number of irregularities which were entered as likely to be improved by the process of regulating was 470 (males 307, females 163), or respectively ratios of 116 (115 and 116) per thousand, while a considerable number of dentures were further entered as being crowded, but yet not sufficiently so as necessarily to demand treatment by regulating. The number of these latter cases amounted to 130 (males 85, females 45), or 32 per thousand.

The column "requiring regulating" gives no clue as to how many of such cases were capable of being relieved by (*a*) extraction only, (*b*) appliance only, and (*c*) extraction and appliance, or those cases in which relief was deemed impracticable. As far as may be judged from the returns it was evident that the majority of cases entered as requiring regulating were those which necessitated the application of some special appliance.

Originally the Committee had intended to have the cases differentiated by a series of appropriate signs, but it was urged

upon them that such a proceeding would render the work unnecessarily laborious and irksome to the examiners; in future returns they would strongly advise some such differentiation, and judging from the frequently very full remarks on this point already entered, such differentiation would diminish rather than increase the labour of inspection.

Biting Capacity and Grinding Capacity. — Seeing that the Government has issued instructions to recruiting officers, under which candidates for the services are rejected because of impaired biting capacity or grinding capacity, it was thought that it would not be without interest to examine the returns in order to determine how many completed dentures (with the exception of the third molars, of course) would fall under this category. Just as the tabulation of the number of perfect dentures (from the ratio of the number of children examined being so small) gives a measure of the number of mouths affected with caries, so the tabulation of the cases included under lost biting or grinding capacity fairly expresses the number of children affected with caries in an extreme degree. By far a great majority of the children do not fall under either of these categories, and this number accurately expresses the number of children who would most benefit by efficient dental service, because in a few years a large percentage of these dentures, which are still savable, would have to be included amongst the hopeless class to which we have just referred. It was ascertained that the biting capacity was lost in only one case (four upper incisors being completely decayed to the roots) and in three cases seriously impaired (two or three upper incisors decayed to the roots).

The grinding capacity was lost in 22 (males 19, females 3), cases on the right side, and 19 (males 18, female 1) on the left side, while in 28 (males 25, females 3) cases it was lost on both sides of the mouth, or in the aggregate a ratio per thousand of 27.8 on one side, and 19 on both sides of the mouth.

The second part of the general table (Appendix E) shows the occurrence of abnormal and accidental conditions, which were not deemed of sufficient importance to be further classified, at present.

Supernumerary Teeth.—A certain number of teeth were found in excess of the normal number, namely, 20 (males 14, females 6); such teeth are not only redundant but most probably without any functional value, and therefore might well have been marked as requiring extraction, though they have not been so included in the present tabulation.

Honeycombed Teeth.—That kind of faulty structure which is not ascribable to any specific disease, and commonly known as honeycombed teeth, is noted in 212 (males 118, females 94) dentures; unfortunately the number of teeth so affected in each case was not noted. Seeing that the number of such cases may vary from 4 to 16 or even more teeth in each case, your Committee would recommend the number of teeth being entered in future examinations.

Syphilitic Teeth.—Hereditary syphilis affecting the permanent teeth was recorded in 20 (males 10, females 10) cases.

Fractured Teeth.—The frequency of injury to the teeth in the athletic field might lead us to anticipate a considerable number of such cases, but it is curious to note that only 37 (males 31, females 6) cases were noted of front teeth fractured from various causes.

Fistulæ.—Abscessed teeth with chronic discharge from a sinus were noted in 82 (males 66, females 16) cases, but it is perfectly certain that a large number of such fistulæ were not entered at all. It was noted in several cases that the sinuses opened not into the mouth but on the outside of the face in 5 (males 4, females 1) cases. As such cases usually mean more or less disfigurement for life, the total, though small, is sufficiently serious, since such a condition may be regarded as almost, if not absolutely, preventable.

Fillings.—In the course of tabulation it was found that only four teeth had been returned as having been filled, out of about 40,000 teeth examined. It was therefore deemed appropriate to classify fillings under the head of "accidents." As the first tabulation was approaching completion a return was made by the dental surgeon attached to the Metropolitan and City Police Orphanage at Twickenham, in which were found the number of teeth entered as filled was 67—a figure unique in our investigations so far.* The fact that the dental officer attached to the school had not confined his professional services to merely extracting teeth has enabled your Committee to represent upon the diagram a very graphic illustration (see diagram A.) of how much professional service of this kind can reduce the effects of caries. The number of teeth requiring attention had to be increased by 80 per cent. in order to place this school in its proper position as to the relative liability of caries.

* Later returns show a total of 237 fillings.

Mr. Fox, the dental surgeon attached to this school, may well be proud of this achievement, and none the less so because it represents an expenditure of professional time for which he can only be partially remunerated by his honorarium of £20.

Bicuspid Enamel Defects.—In commencing the tabulation it was deemed unnecessary to note these cases, but as the number of books examined increased it was found that this condition was occasionally noted, especially as affecting the lower bicuspids. The return is not yet complete, but suffice it to say that it occurs with sufficient frequency to arrest our attention with a view to determine the possible cause of its origin.

Abnormalities or Accidents.—The following rarer abnormalities or accidents were noted as follows:—

	CASES.
Hare Lip	3
Cleft Palate	6
Mouth Breather	8
Closure of Jaws	1
Necrosis of Bone	2
Attachments (Cicatricial)	7
Gemination	3

Tooth Brush.—It is almost needless to observe that the tooth brush was conspicuous by its absence in almost all the schools, and that only in a few schools was the presence of this indispensable equipment noted.

One excellent and direct effect of the present investigation has been the introduction of tooth brushes into several of the schools already examined. That the mere supply of a tooth brush is insufficient is proved by the returns of a small better-class school in Cambridge, where the boys reside with their parents or guardians, and in every case acknowledged their possession of a tooth brush. Not a single mouth could be registered as clean, all were dirty, and a few could only be fitly entered as foul or very dirty. Enquiries as to when the boys used the tooth brush elicited such replies as the following: "On Sundays," "Twice a week," "Occasionally," "When I go out to tea." The authorities, on reading the report sent in by the examiner, wrote to thank him for calling their attention to this condition of affairs, and announced their intention of having it rectified.

One examiner has reported the impossibility of getting reliable information on this point from day scholars, as the children

evidently took the cue from those previously examined whether they should *say* that they had a tooth brush or not.

State of Teeth and Gums.—The returns as to the state of the teeth and gums have been very inaccurately made, as in some schools no return was made at all, while in others it had not been consistently noted throughout the school. There is ample evidence, however, to show that a relatively very small number of cases were marked as clean, while about a somewhat similar number were marked as very dirty or foul, and the majority as fairly clean or dirty. The fact that many of the mouths of these children were noted as being remarkably clean, although they were absolutely innocent of the application of the tooth brush, seems a conclusive proof that mastication properly performed, and aided by the movements of the lips and tongue, is a highly important factor in keeping the teeth clean and the mouth in a healthy condition. It might even be assumed that toughness of the meat supplied to such institutions plays an important part in cleansing the teeth, in the mouths where the teeth are not decayed. It is worth noting that in only one of the thirty-five schools examined were the teeth of the scholars certified as clean—this was the Church of England Home for Waifs and Strays in the Marylebone Road, W.; here excellent tooth brush habits are encouraged by a system of good marks, and is sufficient proof that the result in cleanliness is due more to the interest and the intelligence of the authorities rather than to any remarkable difference of these children from others.

Tartar.—In a certain number of schools returns were made as to the deposits of tartar. In 170 (males 16, females 32) cases the tartar was noted as "little," and in 183 (males 105, females 78) as "much," or altogether 353 cases where it was present.

Diseased Gums.—A diseased condition of the gums, such as inflammation, ulceration, atrophy, and so on was noted in a few schools, and amounted in the aggregate to 48 (males 16, females 32) cases.

Your Committee desire to call particular attention to the fact that the tables and diagrams illustrative of this report should be read in conjunction with the body of the report, otherwise their real interest or value may be overlooked.

The number of schools examined was thirty-five, and their situation may be gathered from annexed list (Appendix F).

A brief report requested by the Committee as to the general

aspect and character of the institution was entered in most, but not all, of the books. In a few cases a report from the medical officer had been obtained. These medical reports are extremely interesting, but it is considered unwise at the present moment to attempt to classify in any way the schools, either as to the general sanitary conditions or the general character of the school diet. It may, however, be assumed that the dietary in the industrial schools is fairly uniform throughout the country. When a larger number of returns have been made, your Committee propose to consider this aspect of the investigation.

In conclusion, your Committee desire to express their opinion that while this report contains statistical information which is thoroughly reliable and decisive on certain points, it is incomplete and imperfect in others. They, however, consider it of very considerable value if only because it calls attention of the profession to a work of public interest, and they hope in such a way that it will lead to a decided increase in the number of the members of the profession taking up the work, and also in an improvement in the method of conducting the same.

It was found impossible to include the returns of over 500 children, because the entries had not been made in accordance with the instructions of the Committee. Your Committee would further recommend that in the future some other method of recording the cases be adopted, in order to simplify the entering of details and to facilitate the tabulation. Your Committee would also recommend to the Representative Board that an official expression of thanks be sent to those gentlemen who, by their labours in conducting the examination of these schools, have so largely contributed to such success as this Report may have.

It is worth while recording what the work of examination really means. Two expert examiners, working together, have been enabled to make a very full and satisfactory report by devoting ten to eleven hours to the examination of 257 dentitions, which is about an average of twenty-five examinations per hour. Another examiner, with an assistant to mark the charts, was enabled to examine on an average thirty per hour, the work being thoroughly well done. This, of course, does not represent the time taken up in getting to and from the scene of labour, which may be taken as averaging about an hour each way. When the examination is conducted by one examiner, without the help of an assistant to record the results of the examination, the time

involved must be necessarily much longer. This estimate does not allow for the time involved in tabulating the results of the individual examinations in their appropriate columns. It will thus be seen that the results have not been obtained without a very considerable expenditure of time on the part of a number of practitioners whose very moments of daylight are precious.

Your Committee respectfully submit the First Report for the approval of the members of the British Dental Association, and should it meet with their approval recommend its publication in pamphlet form for distribution to school and other interested authorities.

FREDERICK CANTON.
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FIRST REPORT OF THE SCHOOL COMMITTEE

OF THE

British Dental Association,

ON THE

CONDITION OF THE TEETH OF SCHOOL CHILDREN.

APPENDICES.

APPENDIX A.—TABLE SHOWING THE CONDITION OF THE TEETH OF INFANTS UNDER TWO YEARS.

M.	F.	Years.	Months.	No. of Teeth Erupted.	No. of Teeth Decayed.	Odd Tooth.
1	—	1	—	0	—	
—	I	I	2	4	—	
I	—	I	2	7	—	L. U. 2nd I.
I	—	I	4	6	—	
I	—	I	4	8	—	
—	I	I	7	9	—	L. U. 1st M.
I	—	I	8	8	—	
I	—	I	10	8	—	
—	I	I	11	5	—	R. U. 1st M.
Total 8 M. & F.		Average 2 Years.		6.8	—	

APPENDIX B1.—GENERAL TABLE SHOWING THE CONDITION OF THE TEETH OF INFANTS* (*i.e.*, all Children who have not yet erupted any of their permanent Teeth).

	2 yrs.	3 yrs.	4 yrs.	5 yrs.	6 yrs.	7 yrs.	Total.
No. of Infants.. ...	8	22	22	40	5	1	98
Teeth not erupted	2	2	0	0	0	0	4
A.—Requiring Filling ...	41	72	108	162	11	4	398
Aa.—Carious, but not requiring Filling (too decayed)	0	0	18	17	3	—	38
Ab.—Prematurely lost ...	—	—	6	—	—	1	7
B.—Requiring Extraction	0	2	2	15	0	—	19
Total A.B.	41	74	110	177	11	4	417
Total Carious	41	74	134	194	13	5	461
Perfect... ..	2	6	7	9	2	—	26
Clean	1	5	5	7	1	—	20
Dirty	2	2	3	3	1	—	11

* Yeadon infants not included—see special Table, App. B2.

APPENDIX B2.—SPECIAL TABLE SHOWING THE CONDITION OF THE TEETH OF INFANTS (*i.e.* all Children who have not yet erupted any of their Permanent Teeth), YEADON NATIONAL AND BOARD SCHOOLS, NEAR LEEDS.

	3 yrs.	4 yrs.	5 yrs.	6 yrs.	7 yrs.	Total.	Per Cent.
No. of Infants	11	50	95	27	3	186	100
Teeth not erupted	—	—	—	—	—	—	—
A. Requiring Filling ...	65	393	638	181	12	1289	687.5
Aa.—Carious, but not requiring Filling (too decayed)	0	18	207	63	0	288	155
Ab.—Prematurely lost ...	2	1	20	5	0	28	15
B. Requiring Extraction	0	10	51	13	2	76	40.8
Total A.B.	65	403	689	194	14	1365	733
Total Carious	65	421	896	257	14	1653	888
Perfect Dentures	0	3	0	0	0	3	1.6
Clean	4	18	19	55	0	46	—
Fairly clean	6	20	24	6	2	58	—
Dirty	1	8	28	12	1	50	—
Very Dirty... ..	0	0	2	0	0	2	—
Tartar (little)	0	1	15	3	0	19	—
Tartar (much)... ..	0	1	2	1	0	4	—
Diseased Gums	0	0	0	1	0	1	—
Honeycombed Teeth ...	1	6	7	2	0	16	8.6
Fistulae	0	7	29	6	2	44	23.6
Gemination	1	0	0	0	0	1	—
Mouth breather	0	2	0	0	0	2	—
Protruding Roots ...	0	1	4	1	0	6	—

APPENDIX CI.—GENERAL TABLE SHOWING THE CONDITION OF THE TEETH OF NON-INFANTS (*i.e.*, all Children who have erupted one or more of their Permanent Teeth).

ENGLISH SCHOOLS.	Boys, 1723.	Girls, 1069.	Total, 2792.	Boys. Ratio per	Girls. 1000.	Total.
TEMPORARY TEETH.						
A.—Requiring Filling ...	1206	1616	2822	700	1511	1010
B.—Requiring Extraction	1646	1075	2721	955	1005	974
Total, A.B. ...	2852	2691	5543	1655	2517	1985
PERMANENT TEETH.						
C.—Carious, savable...	2509	1707	4216	1456	1596	1510
D.—Teeth Lost ...	421	253	674	244	237	241
E.—Teeth Condemned	1276	585	1861	741	547	666
Total, C.D.E. ...	4206	2545	6751	2441	2381	2414
F.—Teeth Condemned ...	370	128	498	214	119	178
G.—Teeth Absent ...	66	26	92	38	24	32
Total C.D.E.F.G. ...	4642	2699	7341	2694	2525	2629
H.—Perfect Dentures						
(a) Complete Period	67	32	99	86	92	88*
(b) Eruptive Period ...	53	19	72	68	29	50†
I.—Retarded Eruption and Undue Retention ...	211	188	399	122	181	142
J.—Requiring Regulating	224	132	356	130	123	123
K.—Crowded (additional)	76	33	109	44	31	39
L.—Biting Capacity.						
Lost ...	—	—	—	—	—	—
Impaired ...	—	—	—	—	—	—
M.—Grinding Capacity.						
Right ...	8	2	10‡	25	10.5	21.7‡
Left ...	7	0	7‡			
Both sides ...	7	2	9	12	10.5	11.4‡

* Calculated on number of Children above 11 years.

† " " " under 12 years.

‡ " " " above 12 years.

APPENDIX C2.—GENERAL TABLE SHEWING THE CONDITION OF THE TEETH OF NON-INFANTS (*i.e.*, all Children who have erupted one or more of their Permanent Teeth).

SCOTCH SCHOOLS.	Boys, 938.	Girls, 332.	Total, 1270.	Boys, Ratio per 1000.	Girls, 1000.	Total.
TEMPORARY TEETH.						
A.—Requiring Filling ...	67	80	147	71	241	115
B.—Requiring Extraction...	418	213	631	446	641	496
Total A.B. ...	485	293	778	517	882	612
PERMANENT TEETH.						
C.—Carious, savable...	1182	350	1532	1260	1054	1206
D.—Teeth lost ...	346	120	466	369	361	367
E.—Teeth condemned	1298	283	1581	1384	852	1244
Total C.D.E. ...	2826	753	3579	3013	2267	2798
F.—Teeth condemned ...	288	92	380	307	277	300
G.—Teeth absent ...	49	9	58	52	27	46
Total C.D.E.F.G....	3163	854	4017	3372	2571	2013
H.—Perfect Dentures						
(a) Complete period	97	19	116	140	129	138*
(b) Eruptive period ...	13	19	32	51	103	73†
I.—Retarded eruption and undue retention ...	39	27	66	42	81	52
J.—Requiring regulating ...	83	31	114	88	93	90
K.—Crowded (additional)..	9	12	21	9.5	36	16
L.—Biting Capacity.						
Lost ...	—	—	—	—	—	—
Impaired ...	—	—	—	—	—	—
M.—Grinding Capacity.						
Right ...	11	1	12	} 36	26	35.1‡
Left ...	11	1	12			
Both sides ...	18	1	19				29	13	27.8‡

* Calculated on number of Children above 11 years.

† " " " " under 12 years.

‡ " " " " above 12 years.

APPENDIX C₃.—GENERAL TABLE SHOWING THE CONDITION OF THE TEETH OF NON-INFANTS (*i.e.*, all Children who have erupted one or more of their Permanent Teeth).

ENGLISH & SCOTCH SCHOOLS.	Boys, 2661.	Girls, 1401.	Total, 4062.	Boys. Ratio per 1000.	Girls. Ratio per 1000.	Total.
TEMPORARY TEETH.						
A.—Requiring Filling ...	1273	1696	2969	478	1210	734
B.—Requiring Extraction	2064	1288	3352	775	918	825
Total A.B.	3337	2984	6321	1254	2135	1556
PERMANENT TEETH.						
C.—Carious, savable	3691	2057	5748	1386	1471	1415
D.—Teeth Lost	767	373	1140	287	266	281
E.—Teeth Condemned	2574	868	3442	967	620	847
Total C.D.E.	7032	3298	10330	2642	2355	2543
F.—Teeth Condemned ...	658	220	878	247	157	215
G.—Teeth Absent	115	35	150	43	25	37
Total C.D.E.F.G. ...	7805	3553	11358	2933	2540	2796
H.—Perfect Dentures.						
(a) Complete Period	164	51	215	111	103	109*
(b) Eruptive Period ..	66	38	104	64	45	55†
I.—Retarded Eruption and Undue Retention ...						
J.—Requiring Regulating	307	163	470	115	116	116
K.—Crowded (additional)	85	45	130	32	32	32
L.—Biting Capacity.						
Lost	1	—	—	—	—	—
Impaired	3	—	—	—	—	—
M.—Grinding Capacity.						
Right	19	3	22}	30.7	15	27.8‡
Left	18	1	19}			
Both sides	25	3	28	20.7	11.2	19‡

* Calculated on number of children above 11 years.

† " " " " under 12 years.

‡ " " " " above 12 years.

APPENDIX D₁.—TABLE SHOWING THE AVERAGE AGE AND THE RATIO OF PERMANENT TEETH DEFECTIVE (C.D.E.) PER 1,000 CHILDREN, ACCORDING TO SEX, NATIONALITY, AND IN THE AGGREGATE.

	MALE.			FEMALE.			AGGREGATE.		
	Aver. Age.		Defective.	Aver. Age.		Defective.	Aver. Age.		Defective.
	Yrs.	Mons.		Yrs.	Mons.		Yrs.	Mons.	
English ...	11	10	2441	11	—	2381	11	5	2414
Scotch ...	12	9½	3013	11	4½	2267	12	1	2798
Total ...	12	3¾	2642	11	2¼	2355	11	9	2543

APPENDIX D2.—TABLE SHOWING THE APPROXIMATE NUMBER OF CHILDREN EXAMINED UNDER 12, ABOVE 11, AND OVER 12 YEARS, ACCORDING TO SEX AND NATIONALITY.

Under 12 Years.				Male.	Female.	Total.
English	...	...	...	773	650	1423
Scotch	...	...	...	254	184	438
Total				1027	834	1861

Above 11 Years.				Male.	Female.	Total.
English	..	...	...	780	345	1125
Scotch	...	...	...	689	147	836
Total				1469	492	1961

Above 12 Years.				Male.	Female.	Total.
English	...	...	...	597	190	787
Scotch	...	...	...	607	76	683
Total				1204	266	1470

APPENDIX D3.—TABLE OF ERUPTIVE PERFECT DENTURES (*i.e.* Normal, and therefore requiring neither Filling, Extraction nor Regulating), FOR CHILDREN UNDER 12 YEARS. ARRANGED ACCORDING TO SEX AND NATIONALITY, WITH THE APPROXIMATE RATIO.

	MALE.			FEMALE.			AGGREGATE.		
	No.	E. P.	Per Cent.	No.	E. P.	Per Cent.	No.	E. P.	Per Cent.
English	773	53	6.8	650	19	2.9	1423	72	5.0
Scotch	254	13	5.1	184	19	10.3	438	32	7.3
Total	1027	66	6.4	834	38	14.5	1861	104	5.5

APPENDIX D4.—TABLE OF COMPLETE PERFECT DENTURES (*i.e.*, all the Permanent Teeth erupted and not decayed) FOR CHILDREN OVER 11 YEARS, ARRANGED ACCORDING TO SEX AND NATIONALITY, WITH THE APPROXIMATE RATIO.

	MALE.			FEMALE.			AGGREGATE.		
	No.	Perfect.	Per Cent.	No.	Perfect.	Per Cent.	No.	Perfect.	Per Cent.
English...	780	67	8·6	345	32	9·2	1125	99	8·8
Scotch ...	689	97	14·0	147	19	12·9	836	116	13·8
Total ...	1469	164	11·1	492	51	10·3	1961	215	10·9

APPENDIX E.—GENERAL TABLE SHOWING ABNORMALITIES, ACCIDENTS, &c., AND THE CONDITION OF MOUTHS OF CHILDREN IN ENGLISH AND SCOTCH SCHOOLS.

ENGLISH AND SCOTCH SCHOOLS.	Boys, 2661.	Girls, 1401.	Total, 4062.
ABNORMALITIES, ACCIDENTS, &c.			
Supernumerary	14	6	20
Honeycombed	118	94	212
Hutchinsonian	10	10	20
Fractured Teeth	31	6	37
Fistulæ	66	16	82
Fistulæ opening on face	4	1	5
Fillings	82	155	237
Bicuspid enamel defects... ..	9	4	13
		Cases.	
Hare Lip	2	1	3
Cleft Palate	4	2	6
Mouth Breather	3	5	8
Closure of Jaws	1	—	1
Necrosis of Bone	2	—	2
Attachments (Cicatrical)	5	2	7
Gemination	1	2	3
Tooth Brush			
STATE OF TEETH AND GUMS.			
Clean... ..			
Dirty... ..			
Foul			
Tartar (much)	105	78	353
Tartar (little)	63	107	
Diseased Gums	16	32	48

APPENDIX F.—LIST OF SCHOOLS AND EXAMINERS.

Dundee " Mars " Training Ship	...	W. M. Fisher and B. B. Saul.
„ Industrial School (Boys)	...	„ „
„ „ „ (Girls)	...	W. M. Fisher.
„ East Poor House School	...	W. M. Fisher and B. B. Saul.
„ Orphan Institution	...	„ „
Arbroath Dale Industrial School, near Dundee		W. M. Fisher and B. B. Saul.
Shadwell Industrial School, near Leeds		W. Henderson Nicol.
St. Saviour's Home, Knostrop, Leeds...		W. Henderson Nicol.
Edgar Street Day Industrial School, Leeds	... ..	George Brunton.
Yeadon National and Board Schools, near Leeds		Oscar Müller for George Brunton and George Cunningham.
Fechney Industrial School, Perth	...	James Stewart.
Wells Hill Industrial School, Perth	...	„ „
Southall, Marylebone Parochial School		Sidney Spokes and R. Denison Pedley.
Herefordshire District Working Boys' Home	.. ...	Peyton Levason.
Police Orphanage, Twickenham	...	Arthur M. Fox.
Weston Reformatory, Warwickshire	...	J. Ross Watt and I. D. Ross Watt.
Castle Howard Reformatory, near York		Thomas King and Arthur Rayner.
Blue Coat School, York	... ..	„ „
St. Stephen's Home, York	... ..	„ „
Union Workhouse, Stockton-on-Tees...		J. W. Dent.
Hull Workhouse School	... ..	J. Chas. Storey & Maudsley Hawkins.
Barner's Industrial School, Manchester		David Headridge.
Ardwick Industrial School, Manchester		„ „
Waifs & Strays' Home, Marylebone Rd.		Sidney Spokes.
Children's Hospital, Paddington Green		C. V. Cotterill.
Trinity College Choir School, Cambridge		George Cunningham.
Lenton Orphanage, Nottingham	...	Henry Blandy.
Beeston Orphanage, Nottingham	...	„ „
Evelina Hospital, Southwark	... ..	R. Denison Pedley.
Protestant Charity School, Birmingham		W. Palethorpe.
Blue Coat School, Birmingham	...	„ „
Salford Union Workhouse School	...	Frederick W. Minshall.
Donaldson's Hospital, Edinburgh	...	G. W. Watson, Junr.
John Watson's Institution	„ ...	„ „ Senr.
St. Matthew's Orphan Home, Bayswater		Ernest C. Davids for Prescott Mallan.
York Industrial School...	... ..
Müller's Orphanage, Ashley Down, Bristol	... ..	Charles A. Hayman.
*Kidderminster Children's Hospital	...	C. Clifford Batten.
*Alexandra Hospital for Hip Diseases, London	... ..	Edward Bartlett.
*West Derby Cottage Homes	... ..	Arthur E. Povey.

* Not included in the present Report.

SECOND REPORT

OF THE

School Committee

OF THE

BRITISH DENTAL ASSOCIATION

ON THE

CONDITION OF THE TEETH OF
SCHOOL CHILDREN.

London :

JOHN BALE & SONS,

87-89, GREAT TITCHFIELD STREET, OXFORD STREET, W.

1892.

SECOND REPORT

THE
SCHOOL COMMITTEE

OF THE

SECTION OF THE TOWN OF
SCHOOL CHILDREN

Second Report

*Of the Committee Appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

PROFITING by their experience in tabulating the results embodied in their first report, and its discussion at our last Annual General Meeting, your Committee have devoted their attention principally to the improvement and simplification of the method of examination, so that there has been something of a pause in actual investigation.

Despite this fact, they are glad to be able to give you the general results of the examination of some 3,368 children—not an unimportant addition to the 4,346 tabulated last year, and thus making a not inconsiderable total of 7,714, involving the examination of some 200,000 teeth. The majority of the cases had to be entered in the old case books; and, as the labour of tabulation involved in the use of these books is consequently so great, there has not been sufficient time to formulate them as in the first report.

The general results, however, are fairly evident from the General Table (A) which is drawn up in consonance with the form adopted so successfully by Messrs. Denison Pedley and Spokes, in making their individual reports to Boards of Guardians. The details of Hanwell and Sutton Schools, and the "Exmouth" Training Ship, London, are shown in the annexed columns.

Λ.—GENERAL TABLE SHOWING SOME OF THE RESULTS OF AN EXAMINATION OF THE MOUTHS OF 3368 BOYS AND GIRLS AT HANWELL AND SUTTON SCHOOLS AND "EXMOUTH" TRAINING SHIP, LONDON.

No.	Temporary Teeth requiring		Permanent Teeth requiring		Temporary Total.	Permanent Total.	Un-sound Teeth.	Teeth Ex-tracted.	Sound Dentures.	
	Filling.	Extract-ing.	Filling.	Extract-ing.					No.	Ratio per 100.
903	1119	745	1222	271	1864	1493	3357	62	137	15.1
1985	2025	966	1173	513	2991	1686	4677	261	527	26.5
480	—	58	973	391	58	1364	1422	170	118	24.6
3368	3144	1769	3368	1175	4913	4543	9456	493	782	23.22

The Hanwell Schools are beautifully situated on high ground, in what was once known as Cuckoo Farm. There are about thirty acres of ground which belong to the schools and surround them. This land is farmed, and the produce is used in the schools, such as butter, eggs, milk and vegetables, &c. The children have all the advantages of a country life and an excellent education.

Owing to the large number of children which were constantly suffering from ophthalmia without obvious cause, Dr. Nettleship of St. Thomas's was asked to assist the medical officers in examining the children, and as a specialist to advise the managers as to what remedy could be found. Dr. Nettleship attributed this affection of the eyes (to a large extent) to the congregation of large numbers of children in one building. In the year 1890, isolation schools were opened for ophthalmic cases, and are occupied by some 230 children. An ophthalmic surgeon was appointed for three years to devote the whole of his time to the treatment of the children suffering, at a salary of £500 a year. "Structural alterations are now in progress in the main building, dividing what has hitherto been one into five, with sixteen feet space between them to give better ventilation to the buildings and the children's play yards. The whole system of drainage has been overhauled, and in great measure re-constructed." (*Vide* Local Government Report, 1890-1891.)

All the children in the ophthalmic buildings were examined,

and there appeared to be no connection traceable between eyes and teeth. The teeth of these children were no better and no worse. Manual instruction is now being carried out in workshops erected for the purpose. There is a large swimming-bath, and an excellent band.

In May of 1892, permission to examine the children in the schools of Hanwell was obtained from the managers, on condition that a report was sent in as to the general results of the examination. This was done, and in consequence a dental surgeon was appointed to attend one day a week, at a salary of £80 per year. [In the report it was advised that at least £100 a year should be given.] This is a notable fact, being so far the most important practical outcome of the Collective Investigation, and is encouraging to those who have undertaken the arduous task of collecting statistics. The number of children at Hanwell is on an average 1,000; out of that number 903 were carefully tabulated.

Each child has or will have a tooth brush, and will pass through the hands of the dental surgeon twice a year for examination and treatment if necessary. A well-equipped dental surgery, with dental chair, engine, gas apparatus, &c., has been provided in the school. A register of all operations is kept, and a monthly detailed report will be submitted to the Board of Management. The importance of such an appointment to the children is obvious, but this is much emphasized when we consider what their future will be, for then it is evident that in addition to the children, the State and the community at large will also be benefited. One extract from the Local Government Board Report will suffice to show this.

Boys sent out during the year 1890:—

Army bands	17
Training Ship, "Exmouth" ...	44
Home for working boys	39
Trades	7
	—
Total	107

Girls sent out during the year 1890:—

Domestic service	53
-------------------------	----

The Sutton School is one conducted under somewhat

similar conditions as to diet, environment and supply of inmates.

In these schools, the Hanwell and Sutton, the ages of the children have been generally ascertainable, but in the case of the training ship "Exmouth," off Grays, Thames, the age was usually unascertainable, ranging from eleven to sixteen or more, and probably averaging fourteen years. All the "Exmouth" boys are chargeable to some union or parish within the Metropolitan Asylums District, and usually come from such district schools as the two former, viz., Hanwell and Sutton. What becomes of them is of more immediate interest to us, which may be seen from the following table B.

B.—TABLE SHOWING THE NUMBER OF BOYS ADMITTED TO THE "EXMOUTH" FROM ITS ESTABLISHMENT ON MARCH 25TH 1876, TO DECEMBER 31ST, 1891:—

Total admissions	4650
Entered the Royal Navy	1289
Shipped as ordinary seamen, deck or cabin boys, apprentices, assist- ant steward, and cooks in the Mercantile Marine	1648
Enlisted as band boys in the Army	583
Engaged in other callings ...	1130

Knowing as we do the requirements of the Army, and the still more stringent standard in the Royal Navy, as to the efficiency of the recruits' denture, the importance of the attention to the teeth of these boys should be manifest to the governing body. Thereby dental efficiency from a naval point of view will be promoted, and a larger number of boys would be eligible for the Royal Navy and would not be obliged to console themselves with the Mercantile Marine, and later in life to find that they could not even acquire extra pay as Naval Reserve Men. The excellent medical service provided, including an infirmary on shore, does not include dental services except occasional extractions by the medical officer. The cleanliness of the boys, and the hygienic conditions of their life are all that can be desired, except so far as the mouth and teeth are concerned. None of the boys possess a tooth brush. All the boys are experts in every kind

of drill except tooth brush drill. It is, therefore, interesting to note the state of the teeth, viz., 13 per cent. clean, 60 per cent. fairly clean, and 27 per cent. dirty. Of the latter only three in 131 were returned as foul. Such a return is very fair under the circumstances, and is partly explicable by the fact that every day on the "Exmouth" at 7.30 p.m. "hard tack" in the shape of ship biscuit is served out.

The examiners in this case attached some importance to the presence of stains on the teeth. Only one case of stained teeth was noted amongst the 63 "clean;" 18 amongst the 288 "fairly clean," and 27 amongst the "dirty" teeth; respectively representing ratios per hundred of 1.58, 6.25, and 21.09. The character of the stains were green and orange coloured. No tooth brush, and hence no tooth powder, is employed in this school, and therefore we have added provision for recording "stains" in future with a view of examining the relation of this condition to effective oral hygiene.

The presence of tartar was noted in 49 cases as "little" and 39 as "much," or respectively, 10.1 and 8.1 per cent., giving a total of 18.2, which harmonises with the record obtained by Dr. Ottofy from the examination of public school children in the United States.

With regard to the temporary teeth, it is obvious that the importance of their condition is very different in the case of such schools as Hanwell and Sutton on the one hand and the "Exmouth" on the other; but it would have been better had their exact condition been as carefully noted in the case of the latter as in the former.

This is an illustration of how some point of the investigation may seem of little importance in an individual school, or to an individual examiner, and yet be of great value by forming an important link in completing the evidence in our collective investigation.

Time has not permitted our being able to classify these schools amongst those tabulated last year, as to the number of defective permanent teeth. And this introduces an important difference of opinion, which it is advisable should be settled once for all. In defining what shall be considered a perfect denture, as it was called in the last report, or a sound dentition, as it is termed in this, should it include or not the number of teeth already extracted? The work of tabulation

proves conclusively that, unless such teeth are included, a very valuable, and perhaps, the most easily ascertainable, standard of comparison will be lost. It is surely self-evident that a school, for instance, in which extractions only were performed, might easily appear to yield a greater proportion of so-called sound dentitions, than one where the forceps was only resorted to as a complement to conservative treatment. Though such teeth may occasionally be lost by some accident, such as a blow, caries is the cause of their loss in almost all cases.

The prevalence of the ravages of caries is what we wish to prove to demonstration, hence, if we catalogue carious teeth which are "savable" and those which are "unsavable," and therefore requiring extraction, it is equally important to note those which are "unsaved" and therefore have been already extracted or lost.

In the case of the "Exmouth," thanks to the new case book, it has been easy to ascertain the difference, which would be a laborious operation in the old. The "sound" dentitions amounted to 39 transitional, where one or more permanent teeth were as yet unerupted and 79 permanent, making in all 118 or a ratio per 100 boys of 24.6. Had the number of cases, where teeth had been extracted, been treated as "sound" dentitions, the percentage would have been raised to 27.5, *i.e.*, increased almost 3 per cent. In other schools examined the difference would be still greater. Time has not permitted of this correction in the case of Hanwell and Sutton, the importance of which is obvious from the foot note appended to the Sutton School Report, calling attention to the number of extractions of first molars. This footnote does not entirely explain matters, as is proved by an examination of Table (C) showing sound dentitions.

It is difficult to resist the conclusion, that a difference in the examiner may account for the surprising superiority of the Sutton School, which is so similar in every way to Hanwell. Again, the "Exmouth" seems to have the "pick" of the boys from these schools, and yet it falls considerably below Sutton.

These facts are alluded to with a view of enforcing the necessity for scrupulous exactness in these investigations, as better a few cases well recorded than a large number hurriedly performed. It also serves to remind us of that ever-varying quantity, the personal equation of the examiner.

Another factor, but of much lesser importance in estimating the perfection of a denture, is the number of teeth absent, which must be taken to mean not teeth as yet unerupted, but only those which may be thought to be permanently suppressed, such as absence of lateral incisors at twelve or more years (*Vide* First Report, p. 8).

C.—TABLE SHOWING SOUND DENTITIONS (*i.e.*, those free from Caries and including those from which Teeth had been extracted or lost, and cases of irregularity).

Age.		No. of Children.	Average Age.	Sound Dentition.	Ratio per 100.
3-5 years	{ Hanwell	60	3.7	16	26.6
	{ Sutton	84	3.7	43	51.2
5-12 years	{ *Hanwell	629	8.4	89	14.2
	{ Sutton	1220	8.5	239	19.6
11-17 years	{ *Hanwell	320	12.3	44	13.75
	{ Sutton	926	12.4	320	34.5
" "	Exmouth	480	14.	{ 133 118	{ 27.5 24.6 }

* Boys of eleven years included in both groups.

It must be admitted that even to the professional mind the statement that in so many children so many teeth temporary or permanent, are defective, fails to convey any very accurate measure of the seriousness or otherwise of the fact. One reliable method of measurement is a tabulation of the number of perfect or sound dentures, while another is the loss of grinding capacity which fairly expresses the number of children affected with caries to an extreme degree. These methods mentioned in our First Report, however, only give us, as it were, the extreme and opposite limits of a scale or standard of measurement.

It is desirable to sectionise this scale, but before presenting our proposal to standardise the intermediate conditions, cognisance should be made of any previous efforts in this direction. The only scale hitherto proposed, so far as we are aware, is that laid down by Professor Broca in the "Instructions générales pour les Recherches anthropologiques à faire sur le vivant," published by the Anthropological Society of Paris (Masson, Libraire de l'Académie de Médecine, p. 246).

He writes as follows under the title "Good or Bad Denture, Loss of Teeth :"—"When all the teeth are intact the denture is *very good* ; if only one or two teeth are carious it is *good* ; *mediocre*, if three to six teeth are carious ; *bad*, if more than six ; *very bad*, if more than half the number of teeth. The state of the denture is measured especially by the *loss of teeth* ; for, if the teeth may sometimes be lost in consequence of an accident or from disease of the gums, it is nearly always caries which is the cause of their loss."

These instructions are intended principally for the examinations of adults, and therefore we think unsuitable for the purpose we have now in hand, viz., the condition of children's teeth.

Despite the great scientific authority of Professor Broca, and our own desire to avoid any needless increase of systems of measurement or investigation, we nevertheless feel bound to submit a different standard of measurement for your approval, as more appropriate for children at least, and as harmonising better with the expressed views and actual treatment of dental practitioners. It will be seen in the following table that the divisions of our own scale are based on the principle of four teeth as the complement. Intact = *perfect* ; 1 to 4 teeth carious = *fair* ; 5 to 8 = *bad* ; more than 8 = *very bad*.

In the case of the "Exmouth," which stands relatively very high in dental efficiency compared with the majority of schools examined, the application of this standard of measurement shows that while 24.6 per cent. have *perfect* dentures, 44.9 per cent. have *fair*, 22.9 per cent. *bad*, and only 5.25 per cent. *very bad* dentures ; exclusive of the 2.25 per cent. of the boys having defective temporary teeth. The wretched condition of children's teeth as revealed in our own investigations has been alluded to in the public press as one which evidently affords the dental profession so much satisfaction : but such a classification enables us to demonstrate that the policy we advocate is one of hope, not of despair ; that the prevention we would enforce can only be effective if applied early in life ; and that, if neglected then, Nemesis will change this hopeful retrievable condition to one of hopelessly, irretrievably, ruined dentures, and to a prematurely toothless, or worse than toothless, a tooth burdened, race.

"EXMOUTH" TRAINING SHIP.

D.—TABLE SHOWING THE RELATIVE NUMBER AND RATIO OF BOYS HAVING DEFECTIVE PERMANENT TEETH (C.D.E., *i.e.* carious, savable; already extracted; and carious, unsavable or requiring extraction).

No. of Defective Permanent Teeth.	No. of Boys, Average age 14 years.	Ratio per 100 Boys.	Summary.	Classification.
0	118	24.6	24.6	Good.
1	54	11.25	44.9	Fair.
2	61	12.8		
3	45	9.4		
4	55	11.45		
5	39	8.1	22.9	Bad.
6	33	6.9		
7	26	5.4		
8	12	2.5		
9	10	2.1	5.25	Very bad.
10	5	1.05		
11	4	0.8		
13	6	1.2		
17	1	0.1		
Total ...	469			
Defective Temporary Teeth ...	11	2.25	2.25	
Grand Total ...	480	99.9	99.9	

Your Committee, having come to the conclusion that the old case-books were unsatisfactory both for examination and tabulating purposes, have devised a new case-book, specimen pages of which they now submit for your inspection and approval. The following are some of the main points in which the new differ from the old case-books. A separate page or chart is devoted to each child, and each page is numbered, while different colours are used to distinguish sex, the boys being entered on white and the girls on pink sheets. With the old books mistakes were quite frequent in the numbering of the cases, and there was no possible method of tabulating detailed results without re-copying the results of the examination. With the new books the work of tabulation can be conducted very expeditiously.

On the return of the books containing the results of the examination of a school, such as the "Exmouth," the binding having been removed, the charts are distributed and classified; they can then be stored away in quarto letter-clip boxes until required for further tabulation, as when it is desired to collect statistics from a number of schools with a view of comparing one sex, age, district, or country with others. For instance, in one of the boxes now exhibited were the charts of all the children whose teeth were free from caries, and classified according to the number of teeth erupted, while in the other the charts were all arranged according to the order of the number of teeth found carious. It is evident that by this new arrangement several possible sources of error are avoided.

A considerable advantage has also been found in presenting the chart of the temporary teeth immediately above the corresponding permanent teeth which succeed them. This will especially facilitate the work in the most difficult period of school life, namely, the transitional period when the child is changing its teeth. After considering every detail very carefully, our effort has been not to needlessly alter the symbols and methods hitherto employed. We have, however, eliminated as far as possible all symbols expressing a surgical opinion with a view to making the examination as far as possible a pure statement of pathological facts, and not of surgical opinion. Hence the removal of such terms as "requiring filling," "requiring regulating." We would also have removed the term "requiring extraction," substituting the expression "carious unsavable," which may be taken as practically synonymous terms, but for a risk of complicating matters and preventing a tabulation of the new cases on the same lines as the tables in the first report.

In the old books, a large number of valuable remarks were made which could not be classified. We have therefore added to the lower part of the page a complete list of the various conditions, diseases, and abnormalities, which may be encountered in such an examination. Instead of expressing in writing any condition which it is desirable to note, all that has to be done is to *underline* the condition present. For instance, in describing the state of the teeth, instead of writing out, as many did before, "fairly clean," all one has to do

is to underline these words under "state of teeth." This part of the work has been headed "optional," but the Committee hope that all examiners will exercise the option, as the value of the examination is thereby greatly enhanced without entailing much extra labour. It should, however, be noted that the lower part should be filled in for all the cases examined in a series of examinations, or not at all, as otherwise they will be of no use for the deduction of averages. The really important matter, however, in making an examination, is to fill in the chart accurately, carefully noting the presence or absence of each tooth, and its condition—in fact, using the chart with the symbols provided—even if the lower columns are not filled up.

We can recommend these new case-books to you as having stood the test of trial, and both Mr. Spokes and Mr. Denison Pedley, who have had large experience in examining under the old system, have expressed themselves not only as much pleased with the new diagram, but that the arrangement of the conditions likely to be encountered on a separate page for each child is highly satisfactory, and a great improvement on the old books. The new books are less bulky and unwieldy than the old, and it is proposed to issue them in books of 50 and 100 sheets.

This work of collective investigation has excited the attention of dental practitioners in other countries, and we are not without hope that some of them will be induced to conduct investigations on similar lines, so that we may be enabled to compare our results with those in other parts of the world.

In submitting these proof books and sheets, the Committee desire to be empowered to order a sufficient number to supply all members of the Association desiring to take part in the work.

Your Committee have to express their obligation to those gentlemen who have conducted the examinations of the schools embodied in this report, namely:—Hanwell, R. Denison Pedley and Sidney Spokes; Sutton, R. Denison Pedley; "Exmouth," W. B. Paterson and H. Baldwin.

The Committee have to report with regret the resignation of Mr. W. H. Fisher and of Mr. E. Lloyd Williams. Mr. Hern retired from the Committee a few months ago, and Mr. Denison Pedley was elected by the Representative Board in his place.

The Committee appeal to the members of the British Dental Association to assist them in carrying on the work, more especially as it is producing very satisfactory results. As instances of that, the Committee would refer to such articles as have appeared during the last year in the medical press, favourably commenting on the work and the necessity for the provision of dental services for school children, and the remarkable address on "Tooth Culture," by Sir James Crichton Browne.

In one large school of 1,000 children, tooth brushes have been provided and provision made for conservative treatment of the teeth by the appointment of a dental surgeon, with the approval of the Local Government Board. In one or two other instances, applications have been made to the Local Government Board for authorisation of similar appointments. Such results ought to encourage a continuation of the work, and as an appendix to this Report your Committee publish a form of Report which has been found useful and effective in acquainting Boards of Management with the results of the investigation of individual schools; the substance matter of such a report can easily be adapted to the requirements of any particular school by merely altering the numbers which had been ascertained by examination.

FREDERICK CANTON.
GEORGE CUNNINGHAM.
LEONARD MATHESON.
W. B. PATERSON.
R. DENISON PEDLEY.
SIDNEY SPOKES.
J. SMITH TURNER.

SECOND REPORT OF THE SCHOOL COMMITTEE
OF THE
British Dental Association
ON THE
CONDITION OF THE TEETH OF SCHOOL
CHILDREN.

APPENDIX.

LONDON, February, 1892.

TO THE BOARD OF MANAGEMENT, CENTRAL LONDON SCHOOL
DISTRICT.

GENTLEMEN,—In May of last year we sought permission to examine the mouths of the children in your School at Hanwell, on behalf of the British Dental Association. You kindly acceded to this request on condition that a Report of the results was furnished to you. The examination was commenced in August and finished by the end of December. 903 children were carefully examined, and as the condition of every tooth in each child's mouth was tabulated in a record kept for the purpose, the investigation deals with over 20,000 teeth. The report we now beg to present to you is constituted as follows :—

- A. Table showing figures bearing upon those points which are of the greatest importance.
- B. A few remarks based upon Table A.
- C. Suggestions for remedial measures considered necessary.

A.—TABLE SHOWING SOME OF THE RESULTS OF AN EXAMINATION OF THE MOUTHS OF 903 BOYS AND GIRLS AT HANWELL SCHOOL.

Age.	No.	Temporary Teeth requiring		Permanent Teeth requiring		Temporary Total.	Permanent Total.	Un-sound Teeth.	Regulation Cases.	Sound Dentition.
		Filling.	Extracting.	Filling.	Extracting.					
3	17	34	—	—	—	34	—	34	—	6
4	43	145	4	—	—	149	—	149	—	10
5	60	196	15	15	—	211	15	226	—	10
6	66	169	50	35	—	219	35	254	—	10
7	70	167	42	72	—	209	72	281	—	11
8	83	134	127	125	2	261	127	388	—	10
9	113	158	135	205	2	293	207	500	6	13
10	131	92	114	188	34	206	222	428	14	23
11	106	18	97	207	54	115	261	376	16	12
12	90	6	87	171	73	93	244	337	21	13
13	67	—	56	95	49	56	144	200	15	15
14	38	—	12	69	45	12	114	126	10	2
15	17	—	4	27	12	4	39	43	1	2
16	2	—	2	13	—	2	13	15	—	—
	903	1119	745	1222	271	1864	1493	3357	83	137

B. REMARKS. 1. With regard to the *Temporary Dentition*.—It is popularly believed that these teeth are not deserving of any particular attention, as in the natural course of events they must disappear to give place to others of the permanent set. Whilst there may be some ground for this view, it is nevertheless true that much misery to children, as well as detriment to health, is avoided by intelligent watching and treating of temporary teeth. This is not the place to set forth arguments upon this question, and we can only call your attention to the fact that, in our opinion, 1,119 temporary teeth require filling; whilst 745 others, or the remains of them, either from being too badly decayed, or from being unduly retained (to the detriment of their successors) beyond the normal period, should be removed. The total number of temporary teeth requiring attention is 1,864.

2. *Permanent Dentition*.—Between 6 and 7 years of age the first teeth of the permanent set may be expected to make their appearance. From their presence in the mouth along with the temporary teeth they are, unfortunately, too often regarded as belonging to the first set, and thus their decay

and loss are ignored, to the great injury of a complete dentition. Instead of being the last teeth of the temporary set, it should be borne in mind that the 6-year-old molars are the first of the permanent set—most important teeth, not only for size and masticating function, but also on account of the position they hold in the jaws and in the series of teeth making up a full set. It is worth while, then, to pay the greatest attention to these individual teeth. After their eruption the temporary teeth are gradually replaced by the corresponding members of the permanent set, and at 12 years, and not until then, the second molars may be expected. It is, therefore, important that, at all events up to that age or period, the 6-year-old molars should be kept in good working order as presenting the only constant masticating surfaces during the change which is taking place between the temporary and permanent teeth. Referring to the table, it will be seen that between the ages of 6 and 12, inclusive, there are more than 1,000 permanent teeth which can and should be saved. By far the greatest number of these are 6-year-old (or first permanent) molars. The percentage of unsound permanent teeth to children, which is 53 at the age of 6 years, rises to 271 at the age of 12 years, and is as much as 300 at 14 years.

3. With regard to cases in which the teeth assume irregular positions (an occurrence which is recognised as one of the predisposing causes of decay, and frequently due to retained temporary teeth), the total is put down at 83 in which it would be right to take steps to remedy the condition, either by removal of certain teeth, or by the application of some mechanical apparatus. But there are several other cases in which the teeth are crowded, and require subsequent inspection.

4. Under the heading *Sound Dentitions* are enumerated those cases in which there was an absence of diseased teeth. Many of these were passing through the transition period between the first and second dentitions. Some children required merely the easy extraction of temporary teeth to place them in a satisfactory state, but it is nevertheless a fact which merits careful consideration, that out of 903 children's mouths inspected there were only 137 which required neither fillings nor extractions—about 15 per cent.—and that in all the others

some condition exists which necessitates special attention in order to procure, as nearly as is possible, a healthy mouth.

C. OBERVATIONS AND SUGGESTIONS.—There is an increasing recognition of the importance of a systematic care of the teeth, apart from any æsthetic consideration. In the case of children, who during the growth of the body have not merely to maintain nutrition, it is surely a matter of urgency that all the organs of digestion should be kept in a state of functional integrity, and if, as seems to be the case, diseases of the digestive tract are increasing, it is evident that any departure from the normal dentition places the child, and the future adult, at a disadvantage. Instead of waiting until a child suffers pain, and thus directs attention to a decayed tooth, it is far better for both patient and operator that the earliest appearance of caries should be noted, and the progress prevented by a regulated system of inspection and prompt treatment. Under such circumstances dental disease and the necessity for painful operations become reduced to a minimum, and at the same time the function of mastication is retained in accordance with what is now recognised as the most beneficial practice. Referring once again to the figures, we would point out that 766 children have between them 3,357 unsound teeth, 1,222 of which are permanent teeth requiring filling. This points the way so clearly that we have no hesitation in recording our opinion that a duly qualified Dental Surgeon should be appointed to your School, and, after careful consideration, we append the following suggestions with reference to such an appointment :—

That in order to cope with the disease of the teeth at present existing in the School it is advisable that the Dental Surgeon should attend once a week (morning and afternoon) for at least two years.

That an inspection of the children's mouths be so arranged that each would be examined twice during the year ; new cases being seen at the first visit after their arrival.

That a record be kept of all operations performed at each visit, and a report presented to the Board.

That the Board should pay a salary of at least £100 per annum for the first two years, and provide the following :—

Dental Chair	...	(say)	7	10	0
Dental Engine	...	"	7	10	0
Stopping Materials		"	5	0	0 (annually.)

£20 0 0 initial outlay.

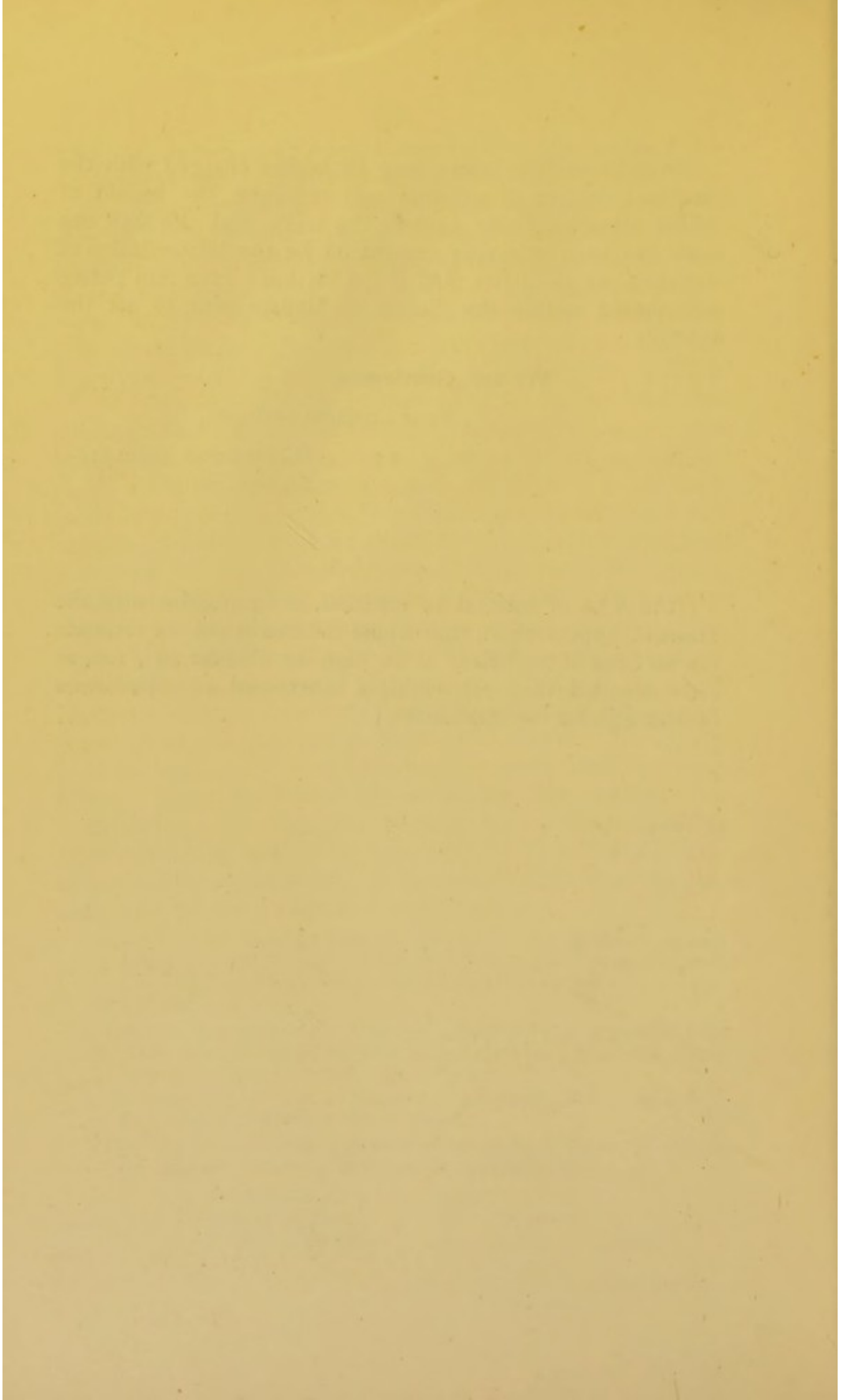
We believe that before long all bodies charged with the care and welfare of children will recognise the benefit of skilled attention being paid to the teeth, and although our work has been primarily carried on for the accumulation of statistics, we shall feel glad if the facts we have laid before you should enable the Board of Management to set the example.

We are, Gentlemen,

Your obedient servants,

R. DENISON PEDLEY,
SIDNEY SPOKES.

[It may be of interest to mention, in connection with the Hanwell appointment, that whilst the Board did not estimate the services of the officer at so high an amount as £100, as recommended, they yet willingly sanctioned an expenditure of over £30 for the appliances.]



Third Report

*Of the Committee appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

FROM the fact that only a working period of little more than six months has elapsed since presenting their second report, your Committee have had little opportunity of getting very much done in the way of fresh examinations. A few of the trial case books and a separate report, comprising the examination of the mouths of 1,900 children, have been returned, and the results are therefore embodied in this report, making a total of 10,517 mouths examined since the commencement of the investigation. The trial case books having proved satisfactory, your Committee have now a considerable stock of the new case books in hand, ready for distribution, and have made arrangements for registering each case book, which is numbered, both on its being sent out and on its being returned.

The Committee would again appeal to the members of the British Dental Association to assist in extending the field of this collective investigation by undertaking examinations.

The schools examined comprise the following:—The London County Council Industrial School at Feltham, examined by Mr. R. Denison Pedley; the West London District Schools at Ashford, near Staines, examined by Mr. Percy L. Webster; the Shibden Industrial School, Halifax, examined by Messrs. Arthur and Alfred Cocker; the Blue Coat School, Walsall, examined by Mr. H. N. Grove; a high-class School at York examined by Mr. A. G. Rayner; and also a better-class

School in Devonshire, examined by Mr. Stephen Mundell : to all of whom the thanks of the Association should be accorded.

The Committee have been disappointed in not obtaining more statistics relating to schools in the neighbourhood of the scene of the Annual Meeting, which would have been of special interest, but this has been due partly to several members being actively occupied in other directions for the success of this meeting, and partly to inevitable delay attendant on the preparation of the new case books.

In future additional interest might be given to these reports were the members in the district of the coming general meeting to take the matter up with that special end in view, but in order to do so the examination should be made some considerable time in advance, as the full tabulation necessarily takes very considerable time, if full justice is done to the returns. The Committee must, however, again point out the urgency of examiners strictly following the instructions accompanying the case-books, as otherwise many valuable observations are lost, and very much unnecessary labour is involved in the task of tabulation. The general results are shown on the same lines as in our Second Report in the General Table (A), p. 3.

As for the first time in this investigation all the cases included in the present tabulation have been made on separate sheets, it has been possible to arrange and collate the results of each mouth examined according to age and to the quality of the denture as affected by caries. All cases of the same age within twelve months were collated, and then tabulated according to the standard of measurement as to the quality of the denture enunciated in our Second Report. Experience has, however, shown than even a fourth, if not a fifth, quaternary group of defective teeth might be added to our former classification with advantage, as measuring the absolutely hopeless condition of a happily very small percentage of dentures at an early age, and as affording an additional means of comparison. (See Table C, p. 6.)

A careful consideration of the numbers and ratios in these classified yearly tables has shown that comparison is greatly facilitated by arranging them in triennial age groups, beginning with the seventh year. Such an arrangement proves to almost

A.—GENERAL TABLE SHOWING SOME OF THE RESULTS OF AN EXAMINATION OF THE MOUTHS OF 1900 CHILDREN AT THE WEST LONDON DISTRICT, FELTHAM INDUSTRIAL, SHIBDEN INDUSTRIAL, WALSALL BLUE COAT, AND TWO HIGH CLASS (DEVON AND YORKS) SCHOOLS.

SCHOOL.	No. Exam.	Temporary Teeth requiring		Permanent Teeth requiring		Tempo-rary Total.	Per-manent Total.	Un-sound Teeth.	Teeth Ex-tracted.	Sound Dentition.	
		Filling.	Extract-ing.	Filling.	Extract-ing.					No.	Ratio per 100.
West London District School, Ashford ...	784	20	1774	647	239	1794	886	2680	41	93	11.8
Feltham Industrial ...	661	21	343	741	639	364	1380	1744	205	123	18.5%
Shibden, Halifax ...	150	16	116	178	140	132	318	450	96	17	11%
Blue Coat School, Walsall ...	100	271	203	156	40	474	196	670	6	4	4%
Mundell's High Class ...	159	0	39	810	130	39	940	979	161	1	0.6%
Rayner's High Class ...	46	0	0	147	3	0	150	150	32	3	6.5%
	1900	328	2475	2679	1191	2803	3870	6673	541	241	12.7

mathematical demonstration the early incipency of dental caries, its rapid progression from bad to worse, and the inevitable fate of these dentures unless controlled by treatment at what is obviously the most advantageous period—that of youth. The numbers examined in the first three age groups from 7 to 15 years, as shown in Table B, are sufficiently large to give reliable average results. The number in the fourth age group, which has been made to include all over 15 years, is not so satisfactory in this respect, and therefore further observations at this age would be especially valuable.

B.—TABLE SHOWING THE RELATIVE RATIO PER HUNDRED CHILDREN HAVING SOUND, DEFECTIVE TEMPORARY, AND DEFECTIVE PERMANENT TEETH, CLASSIFIED QUATERNARILY, ARRANGED IN TRIENNIAL AGE GROUPS.

Age Group.	VII.- IX.	X.- XII.	XIII.- XV.	XVI.- XIX.	Quality.
No. Examined.	333	558	794	83	1768
Sound (no decay)	7.2	11.5	12.3	3.6	Good
Defective Temporary Teeth only	55.3	20.7	6.3	1.3	—
Defective Permanent—					
1 to 4 Teeth	37.2	61.0	56.7	32.4	Fair.
5 to 8 ,,	0.3	6.3	20.0	37.3	Bad.
Over 8 ,,	—	0.5	4.7	25.4	Very Bad.

The rise in the ratio of sound dentures until the third period is fully accounted for by the eruption of good permanent teeth in place of, for the most part, carious temporary teeth, and perhaps by the fact that precocious development is not infrequently attended by exceptional susceptibility to caries. The rapid diminution of cases presenting only defective temporary is only what might have been expected except in so far as they persist into the third and fourth age groups. The schools included in this tabulation may be divided into two very distinct categories, the poor not yet receiving dental treatment, and the rich with dental officers attached. The undue retention of these temporary teeth only occurred in the former class.

The importance of accurately locating and inscribing the number of fillings must be insisted upon, as it is surely evident that, though teeth filled are teeth saved, and therefore no

longer savable or requiring extraction, they were carious and are therefore important factors in establishing the relative liability to caries in the different ranks of life. For statistical purposes, therefore, teeth filled have been tabulated as defective.

The rise and fall of the ratios in the *fair* class, the abrupt increase of those in the "bad" during the third, followed by the serious transition from *bad* to *very bad* during the fourth age period, is more than instructive, and demonstrates the urgency of treatment in the first and second age periods.

In order to test how far conservative dentistry rightly and persistently applied could retrieve the ravages of decay, a table has been carefully compiled, showing that in a high class school of 49 youths between the ages of 11 and 19, 6 per cent. had *good, i.e.,* sound, 61 per cent. *fair*, 29 per cent. *bad*, and 4 per cent. *very bad* dentures; but that, thanks to intelligent and timely treatment, out of the 46 dentures affected by caries, 35 were made *artificially sound, i.e.,* required no treatment, while only 11 youths required treatment in the shape of 20 teeth requiring filling and 3 requiring extraction, and 42 out of the 46 had had 128 fillings.

In another high class school, where considerable difficulties are placed in the way of attendance on the dental officer attached, only 1 had a sound denture, while 25 per cent. had *fair*, 45 per cent. *bad*, and 29 per cent. *very bad* dentures—indeed, at least 14 lads between 14 and 18 years had each from 13 to 20 carious teeth; 26 youths had at least 148 fillings, and only 12 out of 158 were *artificially sound*, and 146 required 692 teeth to be filled, 142 permanent and 28 temporary teeth extracted.

This astounding revelation as to the neglected condition of the teeth of children of well-to-do parents proves the fallacy of trusting to their receiving professional attention during the vacations, unless some means are taken to call the attention of the parents to the matter. The dental appointment in this school is not official, but simply held privately by arrangement with the house masters. The dentist receives fees as from his private patients, and reports great difficulty in treating the boys, for they can only attend on Wednesday and Saturday afternoons, as the masters cannot give their pupils other time without interfering with the school work.

Most of these boys enter the Army, Navy, Civil Service, and the learned professions.

The value of dental attention of a conservative nature is further borne out by contrasting the loss of grinding capacity from defective or absent contiguous teeth on one or both sides of the mouth in schools with a dental appointment, and in those without one. In the two high class schools, the ratio of loss of grinding capacity in 198 boys was $2\frac{1}{2}$ per cent., whereas in three schools without dental appointments the ratio varied from 5.3 to 10 per cent., and averaged in 911 children over $7\frac{1}{3}$ per cent., and further, in the case of the latter schools, several cases were noted where the loss affected both sides of the mouth. This contrast is all the more striking from the evidently greater liability to dental caries in the high class schools, as shown in the number of teeth which are, or had been, defective. It is also worth noting that there are signs of other facts of great interest which further investigation will probably elucidate. In the poor class schools, with a total of 1,594 children examined, the ratio of irregularities returned was about 14 per cent., approximately double the ratio in the *rich* class schools; and similarly the ratio of honey-combed teeth was rather more than as nine to three.

In order to show the desirability of increased statistics as to middle class and high class schools, the following table (C)

C.—TABLE SHOWING THE RELATIVE LIABILITY TO DENTAL CARIES IN POOR AND HIGH CLASS SCHOOLS.

Age Group	X.-XII.		XIII.-XV.		Condition of denture.
	Poor.	Rich.	Poor.	Rich.	
No. Examined	521	37	680	114	
Sound (no decay)	11.7	8.1	14.3	0.9	Good.
Defective Temporary Teeth only	22.1	0	7.4	0	
Permanent Teeth—					
1 to 4 defective	61.2	59.5	60.6	33.3	Fair.
5 to 8 " 	4.8	27.	16.3	42.1	Bad.
9 to 12 " 	0.2	5.4	1.3	16.7	Very bad.
13 to 20 " 	—	—	0.1	7	" "
	100	100	100	100	

has been drawn up, contrasting the relative liability to dental caries as affecting two very widely separated classes. Careful note should be made of the much greater reliance to be placed in the ratios of the *poor* class, as the figures are so much larger than in the case of the *rich* class.

The report from the West London District Schools states that tooth brushes are not provided, but that a considerable number of the children's mouths were fairly clean. To a large extent this is attributed to the wholesome but hard food which the children eat, their excellent habits of general hygiene, and to their healthy surroundings. The absence of tooth brushes and similar general conditions have been reported from the Feltham and Shibden Industrial Schools. In the Walsall Blue Coat School, two boys out of the hundred had tooth brushes, but did not use them, and sad to relate one of these two was the son of a dentist, which doubtless accounted for his having the solitary filled tooth in the whole school.

No reports as to the state of the teeth and tooth brush habits was forthcoming from the larger high class school, except that a little over 8 per cent. were registered as "clean." The only information from the smaller high class school was that each boy had a tooth brush.

Although the effect of the active use of the teeth in mastication has been referred to as an important factor in keeping the teeth clean, the following details prove the necessity of providing tooth brushes, and of enforcing the proper use thereof. In 931 cases (Feltham, Shibden, Walsall), only about 13 per cent. were returned as *clean*, and 42 per cent. as *fairly clean*, while 42 per cent. were classified as *dirty*, and about 3 per cent. as *foul*. Some 30 per cent. were noted also as *stained*, but distributed amongst the last three classes. The presence of tartar was registered as *little* in over 43 per cent., and *much* in over 9 per cent. of the mouths examined.

In their last report your Committee referred with no little satisfaction to the fact that, as a practical outcome of the investigation, the managers of one of the schools examined had made provision for hygienic and conservative treatment by the appointment of a dental surgeon; and in this they would point out with still greater satisfaction that in the first six months the dental officer attending for five hours one day a

week was able to inspect and advise in over 600 cases; and, besides attention to temporary teeth, inserted 169 fillings in permanent teeth. The absolutely necessary extractions of permanent teeth only amounted to 31, many of which were removed under anæsthetics. In about 30 cases much tartar was removed, and some six cases of irregularity were treated. With such an accumulation of work to be done he had of course no time for the more complicated and time-consuming operations, such as pulp capping and root canal treatment.

Your Committee also note with satisfaction that the gentleman holding the appointment has been elected a member of the Medical Officers of Schools Association, which we trust is the foreshadowing of a coming event, viz., either a dental branch of that association or a separate organisation on analogous lines. The opportunity of exchanging views as to practice, and especially the difficulties of practice under peculiar circumstances, is essential to the best results being attained and a high and uniform standard of efficiency being maintained; for, although it is no such very new thing to have a dental officer attached to a school, it is only in recent times that extraction is no longer regarded as synonymous with dentistry and that conservative treatment is deemed of prime importance. Your Committee would urge the advisability of those holding appointments, or those where the emoluments are such as to preclude all dental operations but that of extraction, endeavouring to have these obstacles to efficient treatment removed, by advocating the appointment of dental officers adequately remunerated so as to be able to undertake conservative treatment. Such appointments have already been made in four, if not more of the largest schools in the Metropolitan district, and others are almost certain to follow.

In December your Committee proposed to the Representative Board that the matter embodied in their First, Second and their forthcoming Reports should be condensed in a simple form suitable for distribution amongst the members of the medical profession, managers of schools, and the general public. This was agreed to, and they have much pleasure in submitting that condensed or Popular Report for approval. They also asked to be empowered to approach the Local Government Board on the question of the appointment of dental surgeons to schools under its authority, and

other matters relating to or arising out of this collective investigation, so that the methods of appointments, work, and reports may be arranged on a uniform and sound basis.

This proposal was rejected in favour of an amendment to the effect that the consideration of the matter be postponed until the condensed report had been received and approved of by the Representative Board.

Your Committee respectfully urge the consideration and approval of their proposal, as the Local Government Board has already recognised largely the work of the medical profession, so far as sanitation and preventive medicine are concerned, and has had the question of dental hygiene and treatment of children under consideration. All the new appointments to which we have referred must have received the approval of the Local Government Board, and your Committee attach the highest importance in representing to the central and controlling authority the attitude and the opinions of the British Dental Association as to the importance and the proper regulation of such appointments.

Your Committee would also suggest that many who are unable to devote time to the conduct of examinations, but are nevertheless sympathetic to the objects of the Collective Investigation, could materially promote its progress and development by contributing to a special fund, as considerable personal expense has been already incurred by some members of the Committee, and further expense is advisable in order to remodel the earlier statistics on the new methods of tabulation.

As a result of the progress of this investigation, it is advised that the following means be adopted for the purpose of preventing and ameliorating these results of dental disease:—

(a) That a tooth brush and simple tooth powder be provided for each boy, and that a tooth brush drill after the last meal of the day be instituted.

(b) That a qualified dental surgeon be appointed to attend one day in each week for five or six hours.

(c) That an inspection of the boys' mouths be so arranged that each boy would be examined at least twice during the year: new cases being seen at the first visit after their admission.

(d) That a careful record be kept of all operations performed

at each visit. That a brief report, showing clearly the number of *teeth filled* and the number of *teeth extracted*, especially those of the *permanent* set, be presented to the Committee of Management once in every three months, and that a full report be presented once in each year.

(e) That the Committee of Management should pay the dental surgeon a salary of £100 per annum, and provide a suitably equipped dental surgery and materials.

(f) That as it will be impossible for the dental surgeon to do more than inspect and put all the new boys' teeth in order, besides attending to urgent cases amongst the old boys, it would be advisable to allow the dental surgeon to temporarily appoint a qualified assistant at a weekly salary to attend daily for six hours and carry out treatment under his directions until the teeth of the present, or old boys, especially those in the "fair" class, have been put in order. It is only by some temporary provision of this kind that the present boys' teeth can be adequately treated.

These recommendations were made to and have been recently adopted by the Committee of Management, Trainship, "Exmouth," Metropolitan Asylums Board, with the approval of the Local Government Board. The hours of the attendance and the salary of the dental surgeon are the only points which are not of general application, as it is obvious that the attendance, and therefore the salary, might be proportionally less in a school of less, and more in one of more than 500 children. The estimates as to both attendance and salary are based on the absolute minimal needs of entirely State-supported or so-called pauper children, where very badly decayed teeth would be extracted or left untreated. In other schools there would be a demand for the more complicated dental operations. Such a demand would necessitate a much greater expenditure of time, and therefore of money in the shape of remuneration.

Several County Councils have, under their Technical Education Schemes, embodied amongst their courses lectures on general hygiene which have proved to be amongst the most successful of all. Your Committee are of opinion that as the medical profession have contributed to such success, the dental profession can and should also do their share in adding to the commonweal by promoting a general knowledge

as to how disease, not only dental, but that arising therefrom, may be prevented. It is certain that a resolution, emanating from such a body as the British Dental Association, to the effect that such courses of health lectures would be materially strengthened by including a few short lectures on preventive dentistry, would call the attention of the Technical Education Committees and their organising secretaries to a much-neglected department of personal hygiene which can be made attractive, as well as profitable, by well-illustrated lectures.

The members of the School Children's Committee of the British Dental Association, 40, Leicester Square, London, W., will be glad at any time to report and advise as to the best means of carrying out such examinations, appointments, &c., and to supply copies of the Three Reports.

GEORGE CUNNINGHAM.
LEONARD MATHESON.
W. B. PATERSON.
R. DENISON PEDLEY.
SIDNEY SPOKES.

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Fourth Report

*Of the Committee appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

THE Committee beg to report that about thirty case-books have been issued to applicants (making provision for some 3,000 examinations) since the last tabulation; but only two books, containing 200 examinations, have been returned. It may have been assumed by many that, since over 10,000 children's teeth have now been examined, the object of the Association has been sufficiently attained (*vide* First Report), viz., to show by means of reliable statistics the extent to which dental disease prevails amongst children, and thereby to demonstrate the necessity of some adequate provision being made to meet the evil, and also to provide sufficient data which would convince those in authority that in giving attention to these matters they would be acting in the interests of the public at large as well as in those of the children themselves. While fully admitting the value of the information already acquired, it does not, in the opinion of the Committee, provide that exact knowledge of the conditions of children's teeth at the different ages of school-life which is essential to the completion of their work. As has already been pointed out in previous Reports, this arose entirely from the character of the first series of case-books, for which the present Committee are in no way responsible. The statistics derived from the 2,000 cases recorded in the new case-books have done more to prove the very early origin of decay in certain teeth, the very rapid progress of that decay, and the inevitable fate of such teeth, and their effect on the whole denture, unless treated in an early stage of decay (necessarily, therefore, during the period of

chool life), than 8,000 odd cases recorded in the old case-books. A selection of the best examined schools under the old system has been made, and the examinations re-entered in the new case-books. The appeal for financial help for this purpose from those who are sympathetic to the objects of the Collective Investigation, but are unable to devote time to the conduct of examinations, has met with no response outside of the Committee. They are deeply grateful to one of the largest contributors to their statistics in the last report, Mr. Percy L. Webster, for his valuable help in the uninteresting labour of copying a considerable part of the old case-books, a laborious task which is being advanced as rapidly as circumstances permit.

The school which forms the subject matter of the present tabulation is different in some respects from those already examined.

The general results of this examination of the teeth of 200 waif children are shown in Table A.

TABLE (A) SHOWING THE GENERAL RESULTS OF AN EXAMINATION OF 200 WAIF FEMALE CHILDREN IN NAZARETH HOUSE SCHOOL.

Age	No. Examined	SOUND DENTITIONS			DEFECTIVE PERMANENT DENTITIONS				NO. OF CARIOUS TEETH		
		Temporary	Transitional	Permanent	i.—iv.	v.—viii.	ix.—xii.	Over xii.	Temporary	Permanent	Total
5	12	1	1	...	...	...	...	...	68	...	68
6	11	1	1	...	3	...	...	...	23	6	29
7	19	...	1	...	6	...	...	...	43	15	58
8	24	...	4	...	10	...	...	...	34	22	56
9	25	...	5	...	13	...	...	...	28	34	62
10	31	...	11	1	9	...	1	...	22	30	52
11	22	...	1	1	10	3	...	...	19	46	65
12	30	...	1	1	12	5	1	...	24	73	97
13	14	...	...	3	3	6	1	..	2	55	57
14 and 15	7	...	...	...	3	2	...	1	1	41	42
17 and over	3	...	...	...	2	...	1	...	...	17	17
Total ...	198	2	25	6	71	16	4	1	264	339	603

Two exceptional cases—one at 20 years with 28 defective permanent teeth (14 carious but savable, 8 unsavable, and 6 already extracted); and one "patient born without arms," aged 39, entirely abnormal—practically no teeth at all; feeble intellect.

In conformity with the last report, these results have been tabulated in groups, both as to age and the number of defective permanent teeth, and expressed in percentage terms in each age group. In the first and fifth columns not much value can be given to the percentage figures, as the number of examinations is so small. The intermediate columns are quite instructive, harmonise with the results of the last report, and indicate in a positive manner to what extent decay of the teeth affects the denture as the age of the children advances. It is evident that the rapid diminution in the number of sound and fair dentitions in children between 13 and 15 years of age might be prevented by attention at an earlier age (and the earlier the better), by making them *artificially sound* by excising the decay and filling the teeth. Hence, on a dental appointment being made to such a school, the best use of the dentist's services would be attained by giving his attention to the younger children, and especially to those dentitions classed as *fair*.

TABLE (B) SHOWING THE RELATIVE RATIO PER 100 CHILDREN HAVING SOUND DEFECTIVE, TEMPORARY, AND DEFECTIVE PERMANENT TEETH (CLASSIFIED QUATERNARILY), ARRANGED TRIENNIAL AGE GROUPS. (NAZARETH SCHOOL.)

AGE GROUP	v.-vi.	v	x.	x.-xii.	xiii.-xv.	xv	Quality
NO. EXAMINED	23	68	83	21	3	198	
Sound (no decay)...	16	14'7	19'2	14'3	...	Good	
Defective Temporary (Teeth only)	70	42'6	31'3	9'5			
Defective Permanent :							
1 to 4 Teeth ...	14	42'6	37'3	28'5	66'6	Fair	
5 to 8 ,, ...	...	...	9'6	38'1	...	Bad	
9 or more Teeth ...	...	...	2'4	9'5	33'3	Very bad	

The returns as to the state of teeth have been tabulated, and show that, while 20 per cent. of the children had *clean* and 37 per cent. *fairly clean* teeth, 43 per cent. were scheduled as being dirty, foul, or stained. The necessity for an adequate supply of tooth brushes, and for the early cultivation of their habitual use after the last meal, is evident. Such a provision would not only ensure a higher percentage of clean mouths, and thus conduce

to better health in many ways, but be highly economic by diminishing the necessity for resort to dental treatment. The number of cases of honeycombed teeth amounted to 13 per cent.—a high percentage. There was only one case of syphilitic teeth.

Other interesting conditions were noted, which will be of value in the general tabulation.

The Committee are indebted to Mr. Edward Moseley, of the Dental Hospital of London, not only for these careful returns, but for the prompt and thorough manner in which the investigation was conducted and the case books returned for tabulation.

In addition to the appointment at the London Central District School, appointments have been made at the Kensington and Chelsea, Edmonton, and Hackney District Schools, as a direct outcome of this part of the Association's work. Quite recently, too, the Metropolitan Asylums Board have re-appointed the Dental Officer to the training ship "Exmouth" for a further period. As it is extremely desirable that a uniform system of returns of the work done in such schools be adopted, a proof of suitable recording case books, designed to facilitate the preparation of periodical reports, has been prepared by a member of the Committee. In a future report the Committee hope, with the co-operation of the holders of these appointments, to present a statement as to the results achieved.

The published results of this collective investigation have attracted the attention of dentists in other countries, notably in Sweden, Switzerland, France, and the United States, whence inquiries have been received as to the methods of conducting it. In Sweden a small grant from the Government has been promised for the furtherance of a similar investigation to be conducted by a special committee of the Stockholm Dental Society. After hearing an address on this subject from a member of the Committee, this Society has determined to conduct the examinations on identically the same plan adopted in this country. Such a course of action is to be highly commended, since it will very greatly enhance the scientific value of such returns in each country by making them immediately comparable the one with the other.

In a recently published work, "The Nationalisation of Health," by Mr. Havelock Ellis, there is an interesting and instructive chapter devoted to the place of the dentist in a national scheme

for the improvement of the health of the community. This chapter mainly consists of extracts from the reports of the Committee, and the communications of both past and present members of it. The author's comments are highly appreciative of the work of the Association in this direction, and his conclusions as to the public importance of our views are most satisfactory.

Such recognition should encourage the Representative Board to favourably entertain the proposal of the Committee that the Local Government Board should be approached on the question of the appointment of dentists to the schools under its authority.

From motives of ill-judged economy Guardians have hesitated, and still hesitate, to adopt the only means which would stay the increasing spread of decay of the teeth. It is the duty of the Medical Profession to use their influence at once to render the public cognisant of the danger which menaces them in the persons of their children.

Finally, the Committee have to report with great regret the resignation of Mr. Leonard Matheson, who has acted as Secretary to the Committee since its formation; they, therefore, desire that the best thanks of the Association should be extended to him for his past services, and also to Mr. Moseley and Mr. Percy Webster.



Fifth Report

*Of the Committee appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

SINCE the issue of their last report the Committee have received returns from six schools in which a little over 700 children's teeth were examined, thus making a total of 11,422 since the commencement of the investigation. The schools examined were, with one exception, of the usual character, and comprise the following: St. Paul's Orphanage, Princess Alice Orphanage, and St. Mary's Convent, all in or near Birmingham, examined by Mr. J. W. Turner; the Kensington and Chelsea District School at Banstead, examined by Mr. Maitland; Rishworth Grammar School, a local Charity School, examined by Mr. Arthur and Mr. Alfred Cocker, and Haileybury College, the well known high-class public school, partially examined by Mr. Sidney Spokes; to all of whom the thanks of the Association should be accorded.

As the ages of these children vary from 4 to 17 years, and as the total number in each school is so small, no great value and no new fact of importance can be derived from a publication of the detailed tables giving the general results in each of these schools. As the last report only contained the results of one school of 198 children, these have been added to the general table prepared for this report. The actual figures in this return have been reduced to percentages which are embodied in the following table on the plan which has proved so useful in former years,

and which facilitates comparison with the results of previous returns, by arranging them in triennial age groups, and tabulated according to the standard of measurement as to quality or condition of the denture as set forth in our Second Report.

TABLE SHOWING THE RELATIVE RATIO PER 100 CHILDREN HAVING SOUND, DEFECTIVE TEMPORARY, AND DEFECTIVE PERMANENT TEETH (CLASSIFIED QUATERNARILY), ARRANGED IN TRIENNIAL AGE GROUPS, IN 903 CHILDREN.

At St. Paul's Orphanage, Princess Alice Orphanage, and St. Mary's Convent, Birmingham; Kensington and Chelsea District School; Banstead; Rishworth Grammar School; Nazareth School, Kensington; and Haileybury College.

AGE GROUP	iv.-vi.		vii.-ix.		x.-xii.		xiii.-xv.		xvi.-xviii.		QUALITY	
No. EXAMINED	47		179		332		320		25		903	
Sound (no decay)	7	14.9	19	10.6	33	9.9	23	7.2	...	...	Good.
Defective Temporary Teeth only	35	74.5	68	37.9	43	13.0	5	1.6	...	...	Uncertain.
Defective Permanent:												
1 to 4	...	5	10.6	91	50.9	225	67.8	178	55.6	10	40	Fair.
5 to 8	1	0.6	27	8.1	78	24.4	5	20	Bad.
9 to +	4	1.2	36	11.2	10	40	Very bad.
Total	...	47	100	179	100	332	100	320	100	25	100	903

On comparison with those in a similar table in the Third Report, embracing nearly twice as many examinations, it will be seen that the three middle columns harmonise with previous results in a general way, though there are not so many good or sound dentures and rather more cases of very bad dentures, *i.e.*, with nine or more than defective permanent teeth. The inevitable increase of decay of the teeth as age advances is again clearly shown, although the numbers included in the first and fifth columns are too small to give reliable percentage results. An analysis of the special tables show that this is mainly due to the inclusion of the Rishworth Grammar School and Haileybury College. The latter, being a high-class school, bears out the

results to which we called attention in the Third Report, that the teeth of the rich children seem much more prone to decay than the teeth of the poor charity-school children. In the whole 103 examined so far, only two had dentures free from decay or loss of teeth. Putting aside one of 12 and eight between 16 and 17 years, there were ninety-four between 13 and 15 years of age. Of these, two had *sound*, thirty-eight *fair*, thirty-five *bad*, and nineteen had *very bad* dentures, not counting what seems an unusually large number of fractured front teeth from accidental causes; and all the eight older boys were classified as *very bad*. The real condition was not so bad as these figures indicate, for a large number of carious teeth had been filled, and thirteen boys had *artificially sound* dentures, *i.e.*, required no treatment, all decay having been eradicated. A large number of teeth still require filling, but it is interesting to know that this is being done as rapidly as circumstances and parental intelligence will permit, thanks to the new dental regulations introduced by the Headmaster in conjunction with the resident Medical Officer.

Much too rarely are the medical reports in the new case-books filled in, but in the case of one school the medical report was very full and complete, and accompanied by an analysis of the water. That analysis concludes as follows: "The water was acid to litmus paper, the acidity amounting to 0.28 grains per gallon, if estimated as sulphuric acid. The water contains lead, no doubt taken up by the acid present, the amount being 0.09 grains per gallon." The teeth of these poor charity-school children taken in the two triennial periods, X. to XII., and XIII. to XV., are quite as bad as the rich class, and decidedly worse than the average of their own class. The numbers are too small, it must be admitted, to make the percentages reliable; but, notwithstanding, one cannot dissociate the fact from the certified acidity of the water supply. Similar supplies exist, no doubt, in other schools, therefore it would be interesting to acquire further statistics in this direction. The attention of examiners is therefore called to the importance of the character of the water supply, acidity, hardness, &c., as a part of the medical report in the case books.

Greater care should be taken in filling in the ages, as many charts have to be put aside as useless from the impossibility of classifying them. The examination of boys' teeth should never

be in girls' case-books or *vice versa*, as it entails needless work in recopying.

The Committee regret that their appeals for help and support in carrying on what must be admitted is a useful work do not meet with a more ready and more generous response from a larger number of the members of the Association.

H. BALDWIN.
GEO. CUNNINGHAM.
W. B. PATERSON.
R. DENISON PEDLEY.
SIDNEY SPOKES.

Sixth Report

*Of the Committee appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

YOUR Committee have to report that, despite the urgent appeal made to the members at the last Annual General Meeting for statistics with regard to the condition of the teeth of children, especially at certain ages, no Case-books have been returned for tabulation, except one series of 150 examinations from a member of the Committee. This will prove a valuable addition to the previous statistics, more especially as it comprises the results of the examination of children of a higher class and of a higher age than those forming the bulk of our statistics, thus greatly extending the range of the investigation.

The number of the examinations, however, is not sufficiently great to make a special report at present; suffice it to say that they bear out the fact mentioned in previous reports, that the children in the middle and higher-class schools show a much higher percentage of decay of the teeth than the children of the Poor-law Schools.

Though the Committee have not been collectively active in the preparation of statistics, they have not been inactive in pressing forward the application of the practical lesson derivable from the results already obtained. The Committee have been looking forward with considerable anticipation to the report of the Departmental Committee of the Local Government Board, which has been inquiring into the condition of the Poor-law Schools, perhaps better known under its popular title of the "Barrack Schools" Committee. Knowing that the results of their investigation had been communicated to the

Official Secretary of the Committee, with the offer to supply further details if required, and also that the evidence of a distinguished Local Government Board Inspector strongly advocated the extension of those school appointments which have produced such satisfactory results wherever they have been made, they were simply astonished to find the matter entirely ignored in the Departmental Committee's report.

Your Committee, in their third report at the Annual General Meeting at Birmingham, in 1893, pointed out that they also asked to be empowered to approach the Local Government Board on the question of the appointment of Dental Surgeons to schools under its authority, and other matters relating to, or arising out of, this collective investigation, so that the methods of appointments, work, and reports might be arranged on a uniform and sound basis. This proposal was not entertained, and an amendment was passed to the effect that the consideration of the matter should be postponed until a condensed report of the whole work of the Committee up to that date had been received and approved of by the Representative Board.

Your Committee respectfully urge the consideration and approval of their proposal, as the Local Government Board has already recognised largely the work of the medical profession, so far as sanitation and preventive medicine are concerned, and has had the question of dental hygiene and treatment of children's teeth under consideration. The appointments to which the Local Government Board's Inspector referred must receive the approval of the Local Government Board, and your Committee attach the highest importance in representing to the central and controlling authority the attitude and opinions of the British Dental Association as to the importance of such appointments and their proper regulation.

No action, however, was taken by the Association or Representative Board, but your Committee trust that the time has now arrived when some such action will be considered advisable. They know that there are many officials who are sympathisers with their objects, and who will be only too glad to have their attention publicly called to the urgency of this matter.

(Signed)

GEO. CUNNINGHAM.
W. B. PATERSON.
R. DENISON PEDLEY.
SIDNEY SPOKES.

Seventh Report

*Of the Committee appointed by the Representative Board
of the*

BRITISH DENTAL ASSOCIATION

TO CONDUCT THE

Collective Investigation as to the Condition of the Teeth of School Children.

SINCE the issue of their last report in 1896 the Committee have received returns from three schools, in which nearly 900 children's teeth were examined, thus making a total of 12,318 since the commencement of the investigation. The schools examined were, with one exception, of the usual character, and comprise the following:—St. Edward's School, Totteridge, Herts, examined by Mr. F. M. Farmer; Central London District Schools (Ophthalmic Department), Hanwell, Middlesex, examined by Mr. S. F. Rose; and Haileybury College, Herts, the well-known high-class public school, examined by Mr. Sidney Spokes—to all of whom the thanks of the Association should be accorded.

As the ages of these children vary from 4 to 17 years, and as the total number in each school is so small, no great value and no new fact of importance can be derived from a publication of the detailed tables giving the general results in each of these schools. The actual figures in this return have been reduced to percentages which are embodied in the following table on the plan which has proved so useful in former years, and which facilitates comparison with the results of previous returns by arranging them in triennial age groups, and tabulated according to the standard of measurement as to quality or condition of the denture as set forth in the Second Report.

TABLE (A) SHOWING THE RELATIVE RATIO PER 100 CHILDREN HAVING SOUND, DEFECTIVE TEMPORARY, AND DEFECTIVE PERMANENT TEETH (CLASSIFIED QUATERNARILY), ARRANGED IN TRIENNIAL AGE GROUPS, IN 865 CHILDREN.

At St. Edwards School, Totteridge, Herts; Central London District Schools (Ophthalmic Department), Hanwell, Middlesex; and Haileybury College, Herts.

AGE GROUP	iv.-vi.		vii.-ix.		x.-xii.		xiii.-xv.		xvi.-xviii.		Quality
NO. EXAMINED	68		122		160		453		62		865
Sound (no decay)	16	23·5	20	16·4	42	26·2	20	4·4	2	3·2	GOOD.
Defective Temporary teeth only	46	67·6	75	61·5	5	3·1	1	0·2	...	...	Uncertain.
Defective Permanent Teeth:											
No. 1 to 4 ...	6	8·8	27	22·1	97	60·6	169	37·3	6	9·7	Fair.
No. 5 to 8 ...	...	...	...	...	14	8·7	164	36·2	12	19·4	Bad.
No. 9 or more	...	...	...	...	2	1·2	99	21·8	42	67·7	Very bad.
Total ...	68	99·9	122	100	160	99·9	453	99·9	62	100	865

On comparison with those in a similar table in the Third Report, embracing nearly twice as many examinations, it will be seen that the three middle columns harmonise with previous results in a general way, though there are not so many good or sound dentures, and rather more cases of very bad dentures, *i.e.*, with nine or more defective permanent teeth. The inevitable increase of decay of the teeth as age advances is again clearly shown, although the numbers included in the first and fifth columns are too small to give reliable percentage results. An analysis of the special tables show that this is mainly due to the inclusion of Haileybury College. The latter being a high-class school, bears out the results to which we called attention in the Third and Fourth Reports, that the teeth of the rich children seem much more prone to decay than the teeth of the poor charity school children. In the whole 427 examined so far, only seven had dentures free from decay or loss of teeth; and the differences in the other figures, which are remarkable, are entirely due to the fact that nearly half the total number consists of boys

of a high social class. For, putting aside of one of 12 and 62 between 16 and 18 years, there were 453 children of both classes between 13 and 15 years of age. Of these 4·4 had sound, 37·3 fair, 36·2 bad, and 21·8 had very bad dentures, not counting what seems an unusually large number of fractured front teeth from accidental causes; and nearly all the older boys were classified as very bad. The real condition was not so bad as these figures indicate, for a large number of carious teeth had been filled, and many of the Haileybury boys had artificially sound dentures, *i.e.*, required no treatment, all decay having been eradicated. A large number of teeth still require filling; but it is interesting to know that this is being done as rapidly as circumstances and parental intelligence will permit, thanks to the dental regulations introduced by the Master, the Hon. and Rev. Canon Lyttleton, in conjunction with the resident medical officer.

Frequent allusion has been made in the Committee's reports to the increasing recognition of its work, more especially by those interested in the health of school children. The Committee have received a letter from a prominent and powerful official in the National Education Office of Ireland, which ought to stimulate the Association to greater activity and more generous support of its Committee. It is so interesting as the view of the more intelligent part of the community as to what might be done to promote the ends for which we are striving that your Committee beg to quote it here, repressing the name of the sender, as the letter was marked "non-official."

"In pursuance of the very interesting and agreeable Meeting* of the Dental Association yesterday evening, I beg to suggest that the history of the Association, its aims, and the scope of its functions should be forthwith stated, and a full (but succinct) schedule of hints for managers and teachers of elementary schools in Ireland sub-joined, that might be submitted by the Association for the adoption of the Commissioners of National Education, and be circulated by them amongst the managers and teachers of their schools.

"Your great experience will suggest the popular topics in respect to the causes of degeneracy in teeth, the importance of watchful care of children, and the direction and modes of a counsel of remedy and of prevention; the constitution of teeth, and the foods conducive to their health, and the mechanical defectiveness in their structure, or inter-relations; the connection between the strength and health of

* Annual General Meeting of the British Dental Association, Dublin, 1897.

the teeth and the vigour of the physical constitution of the individual generally; the periods in the growth of children when their teeth should be especially cared for; and the arrangements that are being developed, and that will in the near future be perfected, under the auspices of the Association, and with the philanthropic aid of local practitioners for conserving the national health, at this root of life and strength.

"I merely throw out the idea suggested by your Meeting for consideration.

"Already in all national schools regulations are suspended in relation to excluding children at whose dwellings infectious diseases have broken out; also notices from the Archæological Society in respect to the finding of ancient relics and the rewards offered to the finders are in many schools. It may possibly be, that the elementary schools would furnish an admirable field for the beneficent activity of your Association, wherein a great national work might be accomplished in collecting data for further investigations in dental science, and in giving to that science an appropriate and boundless scope of remedial activity." (*See Appendix I.*)

The Committee are preparing to do what they can to respond to these suggestions, and hope to submit at early date their proposals to the Representative Board for approval.

In our Fourth Report, 1894, reference was made to the chapter, devoted to the place of the dentist, in a national scheme for the improvement of the health of the community in Havelock Ellis' book, and the Committee reported that such recognition should encourage the Representative Board to favourably entertain its earlier proposal to approach the Local Government Board on the question of the appointment of dentists to the schools under its authority. This proposal was again urged in the Sixth Report. Officially no action was taken, but private opportunities have been afforded to certain members of the School Committee of expressing their views.

Your Committee have much pleasure in communicating the requirements now adopted by the Local Government Board, which, though only facultative at present, may become obligatory ere long.

STATEMENT OF CONDITIONS RECOMMENDED FOR ADOPTION BY
BOARDS OF GUARDIANS, OR OF MANAGEMENT, IN REGARD TO
THE APPOINTMENT OF DENTAL OFFICERS.

(1) The officer appointed should be required:—To attend at the school or other appointed place according to his agreement with the guardians or managers. To inspect the teeth of all children admitted since his last visit. From time to time, according to his agreement, to inspect the teeth of all the children in the school or workhouse as the case may be. To attend duly and punctually at each visit upon each child requiring dental treatment, and upon any child who may be brought to him for treatment in the intervals of such visits. To keep a record of his work, and to report the same to the guardians or managers, in a book to be provided by them for the purpose, under the following heads:

Date.

Number of children inspected.

„ temporary teeth extracted.

„ permanent „ „

„ teeth filled.

„ scalings.

„ other operations performed.

Any matters which the dental officer may deem necessary or desirable to bring to the notice of the guardians.

This book should ordinarily be kept at the school or workhouse, and should be laid before the guardians or managers by the clerk at each meeting, and should be produced to the Inspectors of the Local Government Board when required.

(2) The dental officer must be duly registered in accordance with the Statutes in that behalf (41 & 42 Vict., c. 33, 1878, and 49 & 50 Vict., c. 48, 1886), or if not so registered, by reason of any medical or surgical qualification exempting him from the obligation of registration as a dentist, the officer appointed shall produce satisfactory evidence that he holds a licence in dental surgery from either of the following:—

The Royal College of Surgeons of England.

„ „ „ Edinburgh.

„ „ „ Ireland.

The Faculty of Physicians and Surgeons of Glasgow, or other approved authority.

(3) The guardians or managers may pay a dental officer either by—
(a) an inclusive salary, or (b) partly by salary, and partly by fees on a fixed scale for specified operations, provided that all payments for extractions shall be included in the salary assigned to the officer and shall not be made by fee.

(4) If the dental officer attends at the school or workhouse, it would

be necessary that the guardians or managers should provide for his use a suitably equipped surgery, including a dental chair and a dental engine, and such other apparatus as may be necessary. It is desirable that they should also provide the requisite materials for fillings, and such special appliances as may be needed for mechanical treatment.

Local Government Board.

July, 1897.

The necessity of these regulations may be seen from the following letter which was addressed by your Committee to the authorities of a school who proposed to replace the vacancy created by the resignation of the dental officer by giving an increased stipend to the medical officer for undertaking the dental work.

TO THE CHAIRMAN OF THE COMMITTEE OF MANAGEMENT OF
THE KENSINGTON AND CHELSEA DISTRICT SCHOOLS (BAN-
STEAD SCHOOL).

SIR,—I have been requested by the Schools Committee of the B.D.A. to ask you if the following information which has come before them can possibly be correct; viz., that, instead of continuing the appointment of a qualified dental practitioner to the Banstead School, it is proposed to entrust the care of the children's teeth to a medical practitioner who has no dental diploma?

The Committee feel it their duty to point out that the possession of a qualification in dental surgery is now regarded as a *sine qua non* in all public dental appointments for the obvious reason that the medical student, beyond obtaining a slight knowledge of the anatomy of the teeth, and possibly some very small experience in their extraction, has absolutely no training which would fit him for the efficient performance of such dental operations as are essential for the preservation and treatment of children's teeth.

I might remind you that the Schools Committee of this Association have been mainly instrumental in promoting the establishment of such dental appointments as have been, and are being, made throughout the country, and that with a view to the adequate performance of the duties attached to such offices the Committee are prepared to assist authorities with information and advice at all times.

I am, Sir,

Your obedient servant,

W. B. PATERSON,

Hon. Sec.

It is gratifying to know that a properly qualified dentist has now been appointed, and in the future all similar proposals to the above will be rejected by the Local Government Board.

The Committee have received the following official return of the dental appointments made in the Metropolitan District up to the present time, and hope soon to be able to publish a similar return of similar appointments in the Provinces.

LOCAL GOVERNMENT BOARD, WHITEHALL.

Dentists—Metropolis.

Union, Parish, School District, &c.	Establishment	Name of Dentist	Date of Appointment
Central London School District	School, Ophthalmic School	S. Spokes ...	May, 1892
North Surrey School District	School	H. J. Moxon	Dec., 1884
Kensington and Chelsea School District	District School...	E. Keen ...	Jan., 1898
Bethnal Green	School ... ..	...	...
Hackney	School	J. T. Hankey	March, 1894
Westminster	School	H. J. Moxon	Nov., 1886
St. Pancras	School	J. Faulkner ...	April, 1886
Lambeth	School	W. Whitehouse	June, 1886
Strand	School	A. Richards ...	May, 1896
Metropolitan Asylums District	Exmouth Training Ship	E. Keen ...	„ 1893
St. George's-in-the-East ...	School	R. H. Cumine	Nov., 1896

The Committee cannot conclude this report without some allusion to the spread of the movement in other countries; no doubt, greatly fostered and encouraged by the paper and tables, presented on behalf of the Association at the London International Congress of Hygiene and Demography. An investigation in Hungary followed on the further report of our work made at the next Congress held at Budapest, and similarly a large number of Spanish dentists have pledged themselves at the recent Congress in Madrid to conduct an investigation on the exact lines adopted by this Association. At the last International Medical Congress the work of the Association was highly approved and a strong plea made for uniformity of methods on our plan in future investigations; and at the instigation of Herr Lipschitz, certain resolutions were adopted, and will be forwarded to the respective Governments represented in due course. Similar investigations to our own, mostly by individuals, have now been made in Germany (7,835) children,

Switzerland (1,000), Hungary (1,000), and Sweden (1,617), but owing to diversity of methods employed, the tables are not readily comparable, except as to one striking feature—the sometimes even greater prevalence of caries in the teeth of other European children. Our average of 84 children with carious teeth in every 100 examined is singularly in accord with that of most other observers. It should be remembered, however, that the personal equation in the case of one dentist examining a very large number may constitute a great difference in the returns from greater particularity in recording the very earliest appearance of caries. In our case books differences in examiners have been noted, but the Association may be assured that the percentage of sound dentitions showing the serious condition of the teeth of so many children is under and not over-stated. Foreign statistics also corroborate our statement as to the much greater prevalence of caries in the children of a better social class than in those of the very poor. From Herr Forberg's detailed tables of 1,500 Stockholm school children, between the ages of 6 and 16 years, who give a percentage of 10.87 sound dentitions, we learn that of the 35.075 teeth examined 24.57 out of every 100 teeth were carious. No classification of dentures as to quality, viz., "good, fair, bad, and very bad;" have yet been made abroad. The differential details as to other matters, such as food, soft and hard water, hereditary disease and climate, have been very fully dealt with in the foreign tables and are of great interest.

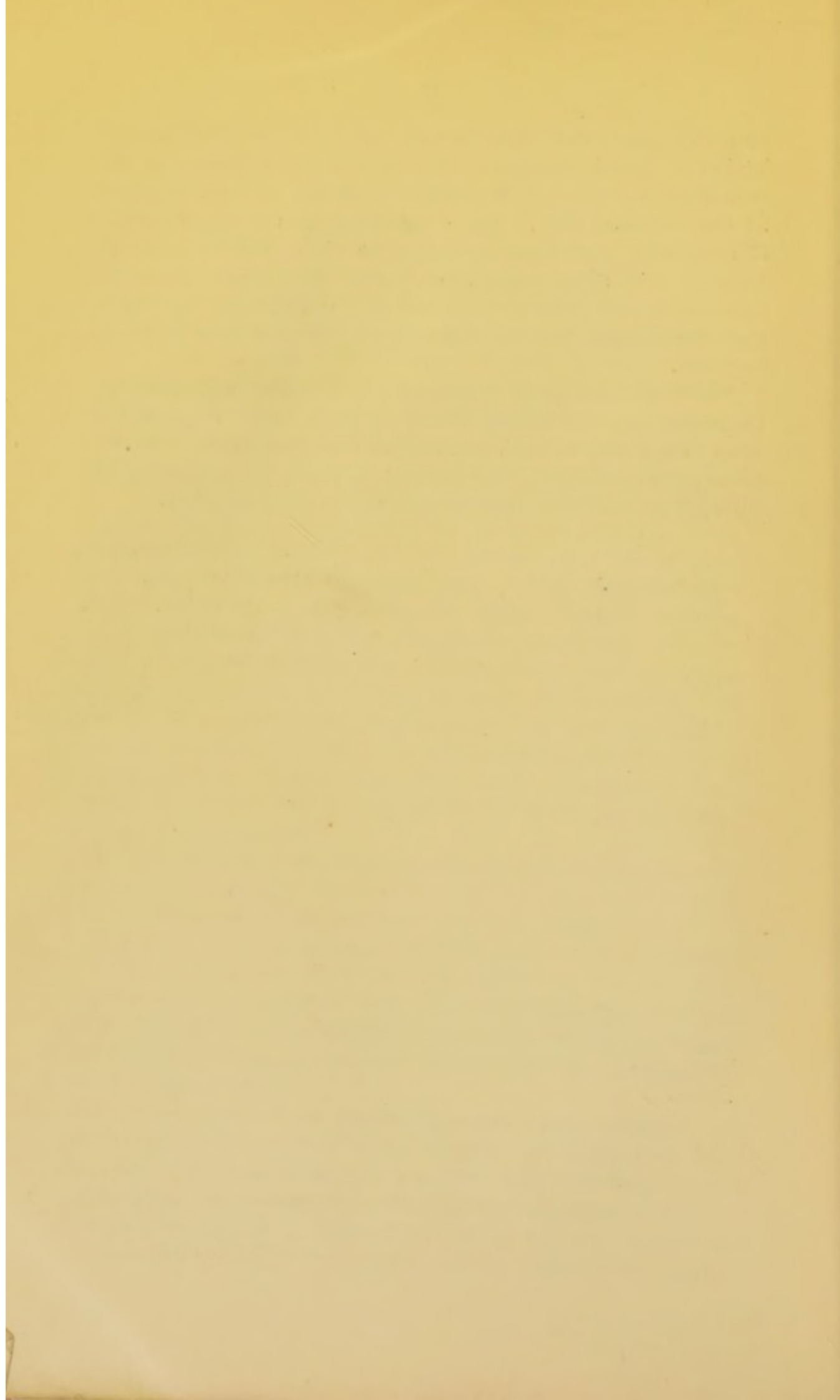
It is worth noting that the Swedish Dental Society rejected the registers proposed by their own Committee, and adopted all the main features of our case-books, only, adding very considerably to the information required from their examiners. Yet that fact has not prevented the dentists in that country sending in the results of over 18,000 examinations, a total which exceeds ours by nearly 50 per cent., and in less than half the time; no doubt a grant of money from the Government was not without effect.

The main cause of the decline in returns from members of the Association in recent years cannot be ascribed to the character of the case-books, for most of those who have made examinations and received school dental appointments have requested permission to have their school registers made on the same plan. May it not be due to the feeling which many

have expressed, that there is not the same urgency for collection of statistics now that there was in the beginning of the movement, and that for all practical purposes we have acquired all the necessary facts. The Committee do not entirely share this opinion, and have constantly in their reports appealed strongly, and again appeal, for further help and support in carrying on what must be admitted is a useful work, and regret that these appeals have not met with a readier and more generous response.

The Committee are of opinion that if a reprint were made of the whole series of reports issued by them since 1891, and a bound copy sent to each member of the Association, it would prove both interesting and useful; it might do something to stir up fresh activity in the compilation of further statistics.

GEO. CUNNINGHAM.
FRANK HARRISON.
W. B. PATERSON.
R. DENISON PEDLEY.
SIDNEY SPOKES.



APPENDIX I.

TO MANAGERS AND TEACHERS OF NATIONAL SCHOOLS.

THE PRESERVATION OF THE TEETH OF SCHOOL CHILDREN.

Rules recommended by the School Children's Committee of the British Dental Association, and circulated for the information of Managers and Teachers of National Schools in Ireland :—

Without good teeth there cannot be good mastication.

Without thorough mastication there cannot be perfect digestion, and poor health results.

Hence the paramount importance of *sound teeth*.

Clean teeth do not decay.

The importance of a sound first set of teeth is as great to the child as a sound second set is to the adult.

Children should be taught to use the tooth-brush early.

Food left on the teeth ferments, and the acid formed produces decay.

Decay leads in time to pain and the total destruction of the tooth.

The substance of the following rules should therefore be impressed constantly upon all children :—

(1) The teeth should be cleansed at least once *daily*.

(2) The best time to clean the teeth is *after* the last meal.

(3) A small tooth-brush with stiff bristles should be used, brushing up, and down, and across ; and inside, and outside, and in between the teeth.

(4) A simple tooth-powder, or a little soap and some precipitated chalk taken up on the brush may be used if the teeth are dirty or stained.

(5) It is a good practice to rinse the mouth out after every meal.

(6) All rough usage of the teeth, such as cracking nuts, biting

thread, &c., should be avoided, but the proper use of the teeth in chewing is good for them.

When decay occurs it should be attended to long before any pain results.

It is the stopping of a small cavity that is of the greatest service.

In 10,000 children's mouths examined, 86 in every 100 required skilled operative treatment.

[Issued by Order of the National Education Office of Ireland.]

APPENDIX II.

It has been deemed advisable to append to the foregoing Reports a specimen page of the Case Books and a reprint of the instructions issued by the Committee, together with the form of letters recommended in making application for permission to inspect schools.

INSTRUCTIONS.

GENERAL.

The Charts should be marked in PENCIL, in order to avoid the inevitable accidental marks from blots if marked in ink.

The name of the school or schools, together with the number of cases and the date of each series of examinations, should be noted on the title page of each Case Book.

The essential points required may be supplied by marking on the chart of the teeth, the extent and position of the decay, the teeth lost, not erupted, extracted or requiring extraction, and those accompanied by fistulæ. Special care should be taken that the number of teeth actually present is accurately shown on the chart, as otherwise errors may arise, as to the frequency of the persistence of temporary teeth in the adult, and so on. With regard to the part of each page headed "optional," the examiner may choose whether he fills it in or not. The Committee would point out, however, that the extra labour involved is not great, and that the value of the investigation will thereby be greatly enhanced.

SPECIAL.

- Name.** Not important ; but it is well to give at least the initials or school number in order to identify the case, should occasion arise.
- Age.** Enter present age in years and months. If the age is doubtful, indicate the same by an interrogation mark after the figure of the reputed age.
- Sex.** Males to be entered on white sheets only. Females to be entered on pink sheets only.
- Temporary Teeth.** (1) Shade in roughly on each tooth diagram the extent of the caries affecting each tooth.—*See Specimen Case—'8, '7, '9, &c.*
 (2) Teeth lost should be indicated by a horizontal line drawn across the diagram, thus : —.—*See Specimen Case—'2, '4, '1, '3, &c.*
- Permanent Teeth.** (1) Teeth not yet erupted should be indicated by a vertical line drawn through the diagrams of such teeth, thus : |.—*See Specimen Case—6, 8, 10, &c.*
 (2) Teeth which have been extracted should be indicated by a St. Andrew's Cross, thus : X.—*See Specimen Case—11.*
 (3) Teeth which should be extracted should be indicated by an oblique line representing one limb of the cross, thus : I.—*See Specimen Case—'8, and 11.*
 (4) Shade in roughly on each tooth diagram the extent of the caries affecting each tooth.
 (5) Any fillings present to be indicated by a simple *outline* on the appropriate tooth diagram.—*See Specimen Case—12.*
 (6) Note on the chart, over or under the appropriate tooth diagram, any existing fistulous opening, thus : ⊙.—*See Specimen Case—'8, and 11.*

OPTIONAL.

This part of the work is extremely simple, as nearly all the information can be noted by merely UNDERLINING the conditions enumerated. This part should be either done for *all* the cases examined or *not* at all, as otherwise the averages will be upset. The first three sections of the first column are the most important.

The only points under abnormalities or accidents calling for special instructions are the first three in the middle column.

Honeycombed.—The number of the teeth and the extent to which they are affected should be indicated as shown on the Specimen Chart, care being taken to note any difference between upper and lower teeth. If the temporary teeth are honeycombed it should be very particularly so marked and mentioned.

Hutchinsonian.—The chart may be employed, unless already used for honeycombed, only noting whether the condition is symmetrical or not.

Enamel Defects.—Some examiners have noted the presence of such, which cannot be classified either as Honeycombed or Hutchinsonian. The number of any teeth so affected should be noted, and details afforded under Remarks.

Remarks.—These are not particularly needed under the new system. Any examiner wishing to make any can do so in the margin or on the back.

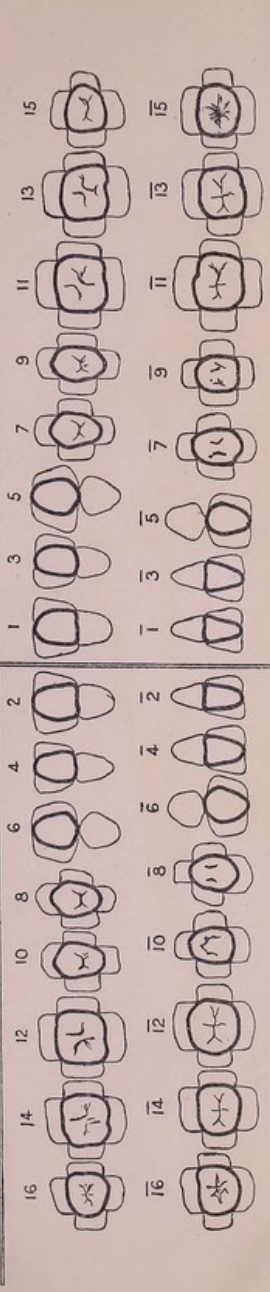
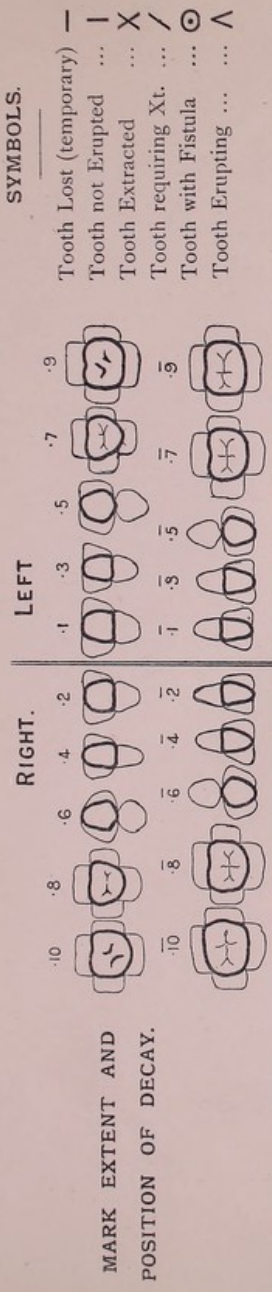
MEDICAL REPORT, *re* DIETARY, SITUATION, &c.

When the inspection of a school has been completed, a brief report should be made as to the general aspect and character of the institution. If any report from the Medical Officer is obtainable, it should be attached to the Case Book. It is important to know what kind of school it is; the position, the aspect, and the general sanitary conditions of the building; from what class of life the children originate; the general character of the dietary, and the habits, especially as to employment and the opportunities for open-air exercise.

In the event of a Dental Surgeon having been appointed to the school, any information as to the number of attendancies, the nature of the services rendered, and the emoluments attached will be welcome. If fillings are done, a return of the number and the cost of installation and maintenance would be useful.

Gentlemen are requested to complete their work and return the Case Books with the least possible delay to the Honorary Secretary, British Dental Association, 40, Leicester Square, London.

MARK EXTENT AND POSITION OF DECAY.



OPTIONAL—Underline any of the following conditions if present.

- STATE OF TEETH—**
 (a) Clean. (b) Fairly Clean. (c) Dirty.
 (d) Foul. (e) Stained.
- TARTAR—**
 (a) Little. (b) Much.
- TOOTHBRUSH—**
 (a) Used. (b) Not used. (c) Has none.
 Natural arrest of caries, No. of.....
 Fractured teeth, No. of.....
- FISTULÆ, No. of.....**
 " opening on face, No. of.....
 Supernumerary, No. of.....
 Geminated teeth, No. of.....
- TEETH FILLED, No. of.....**
 Hare lip. Cleft palate (a) hard, (b) soft.
 Mouth breather. (a) much caries,
 (b) little caries, (c) enlarged tonsils.
 Closure of jaws. Cicatricial attachments.
 Necrosis of bone.



- Hutchinsonian*; Teeth No.....
 Enamel defects not classified above.*
- SOUND DENTITION—**
 (a) Temporary. (b) Transitional. (c) Permanent.
- RETARDED ERUPTION OF TEETH—**
 From undue retention of Temporary Teeth.
 Protruding roots, No. of.....
- GRINDING CAPACITY LOST FROM—**
 (a) Defective or absent contiguous teeth on one side, on both sides.
 (b) Irregularity on one side, on both sides.
- TEETH IRREGULAR—**Upper.....Lower.....

REMARKS :

If possible add up numbers, and fill in below.

	No. of
TEMPERARY TEETH—	
A. Carious savable
Aa. Carious but not requiring filling
Ab. Prematurely lost
B. Requiring extraction	...
Total A.B.
PERMANENT TEETH—	
C. Carious savable
Ca. " unsavable	...
D. Already extracted	...
E. Requiring extraction	...
Total C.D.E.	...
F. Sound teeth to be lost	...
G. Teeth absent
Grand Total	...

* signifies "see instructions."



INSPECTION OF THE TEETH OF SCHOOL. CHILDREN.

In an explanatory letter the Committee suggested a form of letter to be addressed to the lay authority of the School (secretary, board, or head master as the case may be), and a second one to be sent to the medical officer of the institution, as it would, obviously, be not only courteous and polite, but advantageous to communicate with him.

To the AUTHORITIES OF SCHOOL.

It is proposed by the British Dental Association to make an examination of the teeth of children in a number of schools throughout the country in order to obtain statistics for the following purposes :—

1. To acquire a more exact knowledge of the condition of children's teeth at various ages.
2. To show, by means of the facts thus acquired, the disabilities under which children frequently suffer in their growth and development, and the important bearing this condition has upon the future health of the individual.

The Association is convinced that if more attention were paid to the teeth of children, the general sum of public health and well-being would be materially increased, inasmuch as the disastrous effects frequently produced even in early adult life by the decay and loss of teeth may in a very large majority of cases be traced to disease of those organs in childhood. It is, for example, a well-known fact that a large percentage of the young men declared as being unfit for naval and military service, are rejected solely on the ground of dental disease such as might with ease have been prevented by a comparatively small amount of proper attention at an earlier age.

The Association believes that in conducting the proposed enquiry it will be acting in the interest of the public at large, but at the same time care will be taken to avoid calling attention to the affairs of any particular school, which would be as unnecessary as it would be undesirable and unwarranted.

If you can arrange for an inspection in your school, your permission will be much appreciated by the Association, and if you will kindly indicate such a time for my visits as may best suit

your convenience, and least interfere with the School arrangements, every endeavour will be made to fall in with your wishes. For your information I beg herewith to send a list of the Representative Board of the British Dental Association.

I am, yours truly,

Member of the British Dental Association.

To the MEDICAL OFFICER OF SCHOOL.

DEAR SIR,

I herewith enclose copy of a letter which has been forwarded to the of School, of which institution I understand you are the Medical Officer. As such you are in a position to estimate the value of the proposed inspection, and your personal support of this application will be of the greatest importance.

Any suggestion you may make with regard to it, or any information you may be kind enough to afford concerning the diet, employment, or sanitary surroundings of the children under your charge, will be much appreciated. For your information I herewith enclose a list of the Representative Board of the British Dental Association.

I am, yours truly,

Member of the British Dental Association.

