Abstracts of Current Literature*

Anatomy

A Preliminary Survey of the Pouches and Dentition of the Syrian Hamster. P. H. Keyes and P. P. Dale. J. D. Res. 23:427, Dec. 1944.

This article presents a study of the anatomy of the teeth and pouches of the hamster.

Studies on the Incidence and Cause of Dental Defects in Children. VII. Fissures and Caries. Marcu Brucker. J. D. Res. 23:101, April 1944.

This study of 11,410 non-carious first permanent molars in the mouths of 5001 children ages 5-15, showed that from 10 to 18 per cent of these teeth had defective fissures. Carious or filled teeth were not counted. The disproportion between the incidence of caries and the incidence of defects is considered to be so great as to rule out the possibility of a relationship between the two.

Burrill, Chicago.

Variation of Mandibular Incisor Axis in Adult Normal Occlusion. Thomas D. Speidel and Morris M. Stoner. Am. J. Orthodont. and Oral Surg. 30:536, Oct. 1944.

Lateral head roentgenograms of forty-two young male adults with superior dental occlusal relationships were selected for this study. From tracings of the X-rays the following angles were measured:

1) the angle of lower incisor axis with the tangent of the lower border of the mandible averaged 92.64 degrees with a standard deviation of ±6.15 degrees and a range of 28 degrees.

2) the angle of the lower incisor axis with the occlusal plane of the teeth averaged 72 degrees with a standard deviation of ±6.10 degrees and a range of 27.25 degrees.

3) the angle of incisor axis with the tangent to the posterior border of the ramus averaged 28.79 degrees with a standard deviation ±8.37 and a range of 35 degrees.

There is a tendency for the incisor-occlusal plane angle to vary inversely to the incisor-lower border of mandible angle.

Lewis, Dayton.

Anthropology

Dental Abnormalities as Found in the American Indian. Clarence H. Webb. Am. J. Orthodont. and Oral Surg. 30:474, Sept. 1944.

Aboriginal American Indians suffered from the same dental diseases and defects found in modern man. Food habits and dietary factors are of paramount importance to general health whether among aboriginal or civilized peoples, a native state of existence does not automatically insure freedom from dental troubles. Distinct characteristics of American Indians were broad arches, shovel-shaped upper incisors, edge-to-edge bite, and five cusped molars.

Lewis, Dayton.

Bacteriology

Comparative Studies on Lactobacilli Isolated from the Mouth and Intestine. R. W. Harrison and Z. Z. Opal. J. D. Res. 23:1, Feb. 1944.

Lactobacilli were cultured from the saliva and stools of hospitalized child patients. It was found that there was a rough correlation between the numbers of lactobacilli in

* The abstracts of current literature are prepared without comment or interpretation by the editorial staff of The Angle Orthodontist from the following sources: *Journal of the American Dental Association, American Journal of Orthodontics and Oral Surgery, Journal of Dental Research, Journal of Dental Education, Journal of the Canadian Dental Association, British Dental Journal, Dental Record* (British), *Child Development Abstracts and Bibliography, American Journal of Diseases of Children* (Abstract section), and other American and foreign periodicals from which abstracts are occasionally submitted. The abstracts represent a comprehensive though not a complete index of material and dental literature of interest to the specialty of Orthodontics.

the saliva and the occurrence of the organisms in the stools. None were found in the stools of caries free children. Paired oral and intestinal cultures from eight individuals were found to be identical in morphology, fermentative action and immunological reaction. It was concluded that the organisms found in the stools originated in the mouth and that the supply of the organisms in the intestine is continually replenished by swallowing of lactobacillus-containing saliva.

BURRILL, Chicago.

IMMUNIZATION OF HUMAN BEINGS WITH ORAL LACTOBACILLI. N. B. WILLIAMS. J. D. Res. 23:403, Dec. 1944.

Vaccines of killed and living oral lactobacilli injected subcutaneously were found to raise the agglutinin titers of the subjects. Fifteen of the twenty subjects showed apparent reductions in the number of lactobacilli present in the mouth, but only 25% of these showed reductions greater than could be accounted for by change alone. No relationships could be established between the blood agglutinins and the changes in the salivary lactobacillus counts. It was concluded that the immunization had no consistent effect on the numbers of lactobacilli in the saliva.

BURRILL, Chicago.

Case Analysis and Diagnosis

ANATOMICAL AND CLINICAL PROBLEMS INVOLVED WHERE EXTRACTION IS INDICATED IN ORTHODONTIC TREATMENT. GEORGE W. GRIEVE. Am. J. Orthodont. and Oral Surg. 30:437, Aug. 1944.

For years after Angle evolved the "line of occlusion" very few understood its significance, but now it is gratifying to realize how this principle fits into the picture of normal occlusion as some of us understand it today. In the early days when mechanical appliances had not reached the refinement of today the removal of teeth did not turn out so well, nor is it at the present time except in the hands of those who know the location of the line of occlusion and are skilled in the use of efficient appliances with which the teeth can be placed under complete control.

Believing J. Sim Wallace's theory of forward translation we have become more acute in recognizing the absence of normal growth of the maxilla and mandible, and consequent inharmony of tooth material with foundation structures, and are able to obtain a more clearly defined outline of the line of occlusion, which furnishes us with a scientific guide in the analysis and treatment of malocclusion. In some instances a forward displacement of the teeth is so great that it is impossible to carry them back into normal axial relation with the foundation structures, so removal of some of the dental units becomes unavoidable. Where the extraction of four teeth is indicated, the ideal ones are the first premolars.

LEWIS, Dayton.

AN APPRAISAL OF TWEED'S BASIC PRINCIPLES. ALEXANDER SVED. Am. J. Orthodont. and Oral Surg. 30:115, Mar. 1944. (See Growth and Development)

FUNDAMENTAL PRINCIPLES AND EXPEDIENT COMPROMISES IN ORTHODONTIC PROCEDURES. MILO HELLMAN. Am. J. Orthodont. and Oral Surg., 30:429, Aug. 1944. (See Treatment and Retention)

INDICATIONS FOR THE EXTRACTION OF TEETH IN ORTHODONTIC PROCEDURE. CHARLES H. TWEED. Am. J. of Orthodont. and Oral Surg. 30:405, Aug. 1944.

After six and a half years of practicing the philosophy of the full complement of teeth Tweed examined seventy per cent of his finished cases. When stability of end results, health of tissues, efficiency of the dental apparatus and facial esthetics were considered, he found less than twenty per cent were successes.

From his interpretation of Angle's "line of occlusion" the author evolved six fundamental requirements if normal occlusion is to be the end result of orthodontic treatment. His groups of successes and failures are discussed in their relationships to his six fundamentals. His study of faces that approach his concept of normal led Tweed to believe that there is a definite correlation between balanced facial lines and the position of mandibular incisors in relation to basal bone. A study of non-orthodontic normal occlusions was also made.

From his research Tweed concludes (1) the attainment of normal occlusion is limited, (2) in normal occlusion the lower incisors are positioned upright on mandibular basal bone, (3) the ultimate in balance and harmony of facial esthetics is achieved only when the mandibular incisors are so positioned, (4) virtually all malocclusions are characterized by forward drift of the teeth in relation to their basal bones, (5) in the successful treatment of malocclusions, the mandibular incisors must be positioned in a normal relation to their basal bones, (6) the normal relationships of the mandibular incisor teeth to their basal bone is the most reliable guide in the diagnosis and treatment of all Class I, Class II, and bi-maxillary protrusion types of malocclusion, (7) by removing all four first premolars in the treatment of bimaxillary protrusion, it is possible to achieve five of the six requirements for normal occlusion, (8) it is necessary to remove dental units in all those cases where there exists a discrepancy between tooth structure and basal bone.

LEWIS, Dayton.

ORTHODONTICS: ITS OBJECTIVES, PAST AND PRESENT. GEORGE W. HAHN. Am. J. Orthodont. and Oral Surg. 30: 401, Aug. 1944. (See Treatment and Retention)

VARIATION OF MANDIBULAR INCISOR AXIS IN ADULT NORMAL OCCLUSION. THOMAS D. SPEIDEL AND MORRIS M. STONER. Am. J. Orthodont. and Oral Surg. 30:536, Oct. 1944. (See Anatomy)

Case Reports (See Treatment and Retention)

Dental Caries

A MEASUREMENT OF DENTAL CARIES PREVALENCE AND TREATMENT SERVICE FOR DECIDUOUS TEETH. A. O. GRUEBBEL. J. D. Res. 23:163, June 1944.

A system of measurement based on the *observable dental caries prevalence* is suggested for studies of caries incidence and treatment of the deciduous teeth. The symbols used, comparable with the symbols DMF, for decayed, missing, and filled teeth, are *def;* the "d" indicating decayed deciduous teeth indicated for filling, "e," those indicated for extraction, and "f" the deciduous teeth already filled. A study is presented using this system for deciduous teeth in the same way as the DMF system is used for permanent teeth.

BURRILL, Chicago.

A METHOD OF RECORDING AND SCORING GROSS CARIOUS LESIONS IN THE MOLAR TEETH OF SYRIAN HAMSTERS. P. H. KEYES. J. D. Res. 23:439, Dec. 1944.

A NEW CONCEPT OF THE CARIES PROBLEM AND ITS CLINICAL APPLICATION. BERNHARD GOTTLIEB, M.D. J.A.D.A. 31:1489, 1598, Nov., Dec. 1944.

The belief that enamel is a calcified material without organic structures and attacked in the caries process by acid action alone, long held by the dental profession, is incorrect. Caries is a proteolytic process, progressing along organic roads and destroying them; acid action is a component process, evidence of which is seen in X-ray pictures. It is suggested that some element of saliva may continuously impregnate the tooth, blocking the invasion roads and producing natural immunity. Areas where the flow of saliva is impaired show a greater disposition to caries. Chemicals which act to overcome the sensitivity of tooth surfaces are probably also useful in caries prophylaxis; the principles are the same: obstruction of open roads.

WYLIE, San Francisco.

A RELATIONSHIP BETWEEN DENTAL CARIES AND SALIVA. N. C. TURNER and E. M. CRANE. J. D. Res. 23:413, Dec. 1944.

The rate of starch hydrolysis by the saliva was determined by adding portions of starch solution to the saliva and then mixing small quantities with a solution of iodine in potassium iodide at stated intervals, the mixture appearing brown when the end point was reached. The results indicated that there was an inverse relationship between the hydrolysing time and the number of cavities in the teeth of the person supplying the saliva.

BURRILL, Chicago.

A Study of the Bilateral Incidence of Carious Lesions. D. B. Scott. J. D. Res. 23:105, April 1944.

Radiographs of the posterior teeth of 300 individuals were studied to determine whether dental caries was bilateral. It was found that about three-fourths of the teeth were affected symmetrically in bilaterally identical pairs. Etiology and clinical significance are discussed.

Burrill, Chicago.

Data on Eruption and Caries of the Deciduous Teeth. Carl R. Doering and Margaret F. Allen. Child Development. 13:113, June 1942. (See Physiology)

Dental Caries. B. Gottlieb. J. D. Res. 23:141, April 1944.

It is suggested that dental caries is primarily a proteolytic process characterized by yellow pigmentation. In *frontal caries* the bacterial invasion and proteolysis proceeds along prism sheaths slowly and decalcification by acids formed in the mouth keeps up with it. In *undermining caries* the bacterial invasion and proteolysis proceed along enamel lamellae, or if frontal caries goes deep enough, along the tufts of dentino-enamel junction. Three phases were observed: decalcification by acids, proteolysis with yellow pigmentation, and necrosis with cavity formation, necrotic debris formed. Dentin and cementum contain more organic material and are more subject to proteolysis, so that decay, once in the dentin, will undermine the overlying intact enamel. The author advises placing a filling wherever there is a break in the enamel with discoloration, and further states that radiographic evidence of decay is relatively late in appearing, so that a filling should be placed where ever radiographic evidence of a cavity can be seen.

Burrill, Chicago.

Dental Caries in the Cotton Rat. II. Production and Description of the Carious Lesions. J. H. Shaw, B. S. Schweigert, C. A. Elvehjen, P. H. Phillips. J. D. Res. 23:417, Dec. 1944.

The cotton rat is suggested as a laboratory animal for the study of dental caries. It was found that the animal was highly susceptible to caries when raised on a diet high in sucrose, and highly resistant to caries when fed on a caries preventing diet. The type of carious lesion is shown and the method of production presented.

Diabetes in Relation to Certain Oral and Systemic Problems. Part I: Clinical Study of Dental Caries, Tooth Eruption, Gingival Changes, Growth Phenomena and Related Observations in Juveniles. D. E. Ziskin, E. H. Seigel, W. C. Loughlin. J. D. Res. 23:317, Oct. 1944 (See Pathology)

Domestic Water and Dental Caries. H. T. Dean, F. A. Arnold, Jr., E. Elvove, David C. Johnston and E. M. Short. Pub. Health Rep. 57:1155, August 7, 1942. (See Dental Hygiene & Public Health)

Domestic Water and Dental Caries. VI. The Relation of Fluoride Domestic Waters to Permanent Tooth Eruption. Edwin M. Short. J. D. Res. 23:247, Aug. 1944.

On the basis of examinations of the teeth and mouths of children in communities whose domestic water contained fluorine in amounts ranging from 2.6 to practically 0 parts per million, it was found that the water supply containing fluorine in the amount of 2.6 parts per million was associated with delayed eruption of the permanent teeth in children 12 years of age who had been exposed to the water all their lives. Less than 2.0 parts per million of fluorine did not produce a significant difference in time of eruption. Since concentrations which do not influence time of eruption do influence the caries incidence, the effect of the fluorides on caries cannot be explained on the basis of differences in time of eruption of the teeth.

Burrill, Chicago.

Histopathology of Enamel Caries. B. Gottlieb. J. D. Res. 23:379, Oct. 1944.

Extracted carious human teeth were first etched in nitric acid and then prepared for study, some by grinding and some by decalcification and sectioning. It was found that the carious process first invaded the enamel prism sheath, then the prisms, increasing their

resistance to acid. Later the sheaths become black and are digested. Lastly, the prisms also become necrotic. The four stages were stated to be: thickening of the organic framework, invasion of the prisms and blackening of sheaths, disappearance of sheaths, and replacement of enamel structure by necrotic mass.

BURRILL, Chicago.

IMMUNIZATION OF HUMAN BEINGS WITH ORAL LACTOBACILLI. N. B. WILLIAMS. J. D. Res. 23:403, Dec. 1944 (See Bacteriology)

INFLUENCE OF HEREDITY AND ENVIRONMENT ON THE CARIES PICTURE OF MONO-ZYGOTIC TWINS. WILLIAM H. BRUCKER. J.A.D.A., 31:931, July 1944. (See Heredity)

INHERITANCE OF SUSCEPTIBILITY TO CARIES IN ALBINO RATS (MUS NORVEGICUS). H. R. HUNT, C. A. HOPPERT, W. G. ERWIN. J. D. Res. 23:385, Oct. 1944.

Caries susceptible and caries resistant strains of rats were developed, indicating that heredity is a factor in development of rat caries. Earlier findings that rat caries could be produced by a diet containing coarsely ground rice were confirmed and it was found that if the rice was finely ground the development of caries was delayed.

BURRILL, Chicago.

INTRAORAL HYDROGEN ION CONCENTRATION ASSOCIATED WITH DENTAL CARIES ACTIVITY. ROBERT M. STEPHAN. J. D. Res. 23:257, Aug. 1944.

The hydrogen ion concentration in deposits on the surface of the teeth was measured before and after application of glucose solution in caries immune and caries susceptible subjects. It was found that the pH dropped after glucose in all mouths, but that at the lowest point the pH was lower for susceptibles than for immunes. There was a greater drop in pH on the upper than on the lower anterior teeth. In susceptibles the pH remained low longer than in immunes. The significance of the findings is discussed.

BURRILL, Chicago.

MUTATIONS OF BACTERIA UNDER DIETARY INFLUENCE. P. H. BELDING and L. J. BELDING. J. D. Res. 23:375, Oct. 1944.

Streptococcus Salivarius cultured in a sucrose medium tends to mutational forms which are more acidogenic. Addition of cereals continues the tendency toward change. Only the refined cereals are effective in continuing the mutation. It appears that in the absence of sucrose even refined cereals may be ingested without bacteriological harm, but that after sucrose is added to the diet and the bacteria present have changd to acidogenic forms, practically all carbohydrates may be changed to acid with great rapidity, as may even proteins, and all may contribute to the carious process.

BURRILL, Chicago.

PRODUCTION AND INHIBITION OF DENTAL CARIES IN SYRIAN HAMSTERS. P. P. DALE, J. P. LAZANSKY, P. H. KEYES. J. D. Res. 23:445, Dec. 1944.

Hamsters were fed on caries producing diets, some with fluorine added and some with substantially no fluorine. Dental decay was found in all groups, but no animal on the fluorine free diet was free from caries. Some on the high fluoride diets were free from caries. The fluorine was tolerated without deleterious effect and had a definite caries inhibiting effect. It is suggested that hamster dental caries is similar to human dental caries and that the animal is valuable for caries investigations.

BURRILL, Chicago.

RAMPANT DENTAL CARIES: PREVENTION AND PROGNOSIS (A FIVE YEAR CLINICAL SURVEY). HERMANN BECKS, M.D., D.D.S.; ARTHUR L. JENSEN, D.D.S., and COMPTON B. MILLARR, D.D.S. J.A.D.A. 31:1189, Sept. 1, 1944.

An exhaustive study was made of a large number (over 1500) of individuals, including persons who were caries immune and those with rampant caries, using clinical and roentgenographic oral examinations, L. acidophilus determinations, and evaluation and change of food intake. It was shown beyond question that there is a definite relationship between the presence and absence of L. acidophilus in caries activity and inactivity respectively, and that reducing the intake of refined carbohydrates (replacing the calories derived

from these foods by increasing the intake of meat, eggs, vegetables, milk and milk products) results in a reduction of the L. acidophilus count with a concomitant reduction in caries experience. In 72% of cases who adopted improved dietary habits, the caries process was stopped entirely; if the reduction of caries to one or two cavities can be considered a successful response, the percentage of success rises to 88%.

WYLIE, San Francisco.

RAMPANT DENTAL CARIES: PREVENTION AND PROGNOSIS. A FIVE YEAR CLINICAL SURVEY. (abstract). H. BECKS, A. L. JENSEN, C. B. MILLAR. J. D. RES. 23:210, June 1944.

In this study of a large number of caries cases it was found that caries activity or inactivity was reflected in positive or negative lactobacillus indexes, respectively; that the lactobacillus count dropped when the amount of refined carbohydrate in the diet was reduced; that a drop in rate of decay accompanied the drop in lactobacillus counts when refined carbohydrate was reduced. It is stated that caries control by means of lactobacillus counts and dietary measures would be practical.

BURRILL, Chicago.

STUDIES ON THE INCIDENCE AND CAUSE OF DENTAL DEFECTS IN CHILDREN. VI. PITS AND FISSURES. MARCU BRUCKER. J. D. RES. 23:89, April 1944.

The idea of the "prophylactic odontotomy" is attacked on the ground that many of the teeth thus filled would never need filling, and that the margins of the fillings offer about the same opportunity for decay as did the original pits or fissures. In this study of the permanent first molars of about six thousand children, it was found that the highest occurrence of carious first molars was 59.1% in girls 13-15 years of age. This figure is compared with the generally accepted, but unsupported, idea that 98% of the teeth will decay. Furthermore it is pointed out that the incidence of decay is lower in negro children in spite of the fact that prophylactic fillings were more frequently placed for white children than for negro.

BURRILL, Chicago.

STUDIES ON THE INCIDENCE AND CAUSE OF DENTAL DEFECTS IN CHILDREN. VII. FISSURES AND CARIES. MARCU BRUCKER. J. D. Res., 23:101, April 1944. (See Anatomy)

THE EFFECT ON CARIES INCIDENCE OF A SINGLE TOPICAL APPLICATION OF FLUORIDE SOLUTION TO THE TEETH OF YOUNG ADULT MALES OF A MILITARY POPULATION. F. A. ARNOLD, JR., H. T. DEAN, D. E. SINGLETON, JR. J. D. RES. 23:155, June 1944.

Sodium fluoride solution (5000 ppm.), was applied topically to all surfaces of the teeth of subjects in one of two matched groups. Clinical and radiographic examinations before and a year after the application showed that the application of the fluoride produced no change in caries incidence. Likewise no change was produced in salivary lactobacillus counts.

BURRILL, Chicago.

TWO KINDS OF UNDERMINING ENAMEL CARIES. B. GOTTLIEB. J. D. RES. 23:169, June 1944.

On the basis of both ground and decalcified section, *diffuse undermining enamel caries* and *caries spreading along incremental lines* are described. In the first, the more calcified external layer of the enamel is less affected than deeper layers, producing the undermining effect. In the second the interprismatic substance is enriched by the substance of micro-organisms to such an extent that while amorphous it is resistant to the acids used in decalcification. Caries of the enamel is said to be proteolytic in nature and to be characterized only by yellow pigmentation.

BURRILL, Chicago.