

**Oral diagnosis:
Progress review of 1958**

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Reprinted from THE NEW YORK STATE DENTAL JOURNAL, Vol. 25, No. 10,
pages 443-464. December, 1959.

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Introduction

An attempt will be made in the following pages to outline the advances in oral diagnosis during the year 1958.

In order to set the limits of this report, the reviewers have accepted the definition of oral diagnosis as the *art or act of differentiating one oral condition from another*. This concept is in accord with the definition set forth in the *Report of the Curriculum Survey Committee* of the American Association of Dental Schools.¹ This same definition was employed in previous reviews in 1956² and 1957.³

Progress during the year 1958 may be conveniently classified into six general categories: (1) publications dealing with *nomenclature*, (2) *oral diagnosis education*, (3) *textbooks*, (4) *clinical examination*, (5) *roentgenographic examination*, and (6) *laboratory techniques*.

Nomenclature

During 1958 one article and one textbook concerned with nomenclature appeared in the literature. Bernstein

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et al.⁴ made a plea for re-evaluation of the terms *latent cyst*, *early cyst*, and *embryologic defect*. Denton⁵ published an excellent textbook on nomenclature designed particularly for the use of the dental profession. The text not only includes definitions of important terms but also describes etymology.

Education

Four articles have appeared during 1958 dealing directly with the problems of the teaching of oral diagnosis. Mitchell⁶ explained the purpose of a department of oral diagnosis and the administration of this particular unit at the University of Indiana School of Dentistry. Shunock⁷ presented an outline of what he regards as the proper oral diagnostic method. He made a plea for comprehensiveness and orderliness. Dale⁸ pointed out the echelons of the oral diagnostic technique with the lowest level being cursory inspection with mirror and explorer. However, he indicated a higher level consisting of a comprehensive evaluation. Cheraskin et al.⁹ composed a complete review of the study of the teaching of oral diagnosis and oral medicine. On the basis of the available literature and their experiences, the authors proposed one plan for teaching this discipline at the undergraduate, graduate, and post-graduate levels.

Textbooks

Two texts indirectly related to oral diagnosis were released in 1958 including a first edition of an oral pathology book by Shafer and his colleagues¹⁰

and a first edition on oral roentgenology by Stafne.¹¹

Clinical examination

The useful diagnostic chain of reasoning, from the gross to the particular, has been suggested by Cheraskin and Langley.¹² Contributions of the 1958 literature will be prescuted within this framework. When a patient presents for diagnosis, the orderly use of the suggestive evaluative categories yields a logical flow to the clinical procedure: (1) *gross appraisal of the patient*, (2) *examination of the head and neck*, and (3) *examination of the oral cavity*.

Gross appraisal of the patient

The gross appraisal of the patient includes *ten* categories: (1) *stature*, (2) *gait*, (3) *speech*, (4) *age and sex*, (5) *hands*, (6) *history*, (7) *personality*, (8) *temperature*, (9) *pulse*, and (10) *blood pressure*. Not all of these items received attention during 1958.

Speech: At the Neurologic Clinic of the University of Tübingen in Germany, Langen¹³ examined 300 case reports in which the description of the patients' complaints had led to inaccurate diagnoses. It was established that patients with organic diseases usually are able to describe their complaints in a brief, matter-of-fact manner. In contrast, neurotic patients often give verbose, circumstantial, and emotionally charged descriptions with considerable emphasis upon relatively unimportant extrinsic events. The conclusion drawn by the author was that careful attention to the patients' speech behavior and verbal expressions may help to avoid inaccurate diagnoses. Kahmitova¹⁴ studied the speech of 48 patients with palatal defects to determine the degree of phonetic impairment. Case reports were included to

show a correlation between the size of the palatal defect and the inability to pronounce various speech sounds. Allen¹⁵ prepared palatograms of a group of dentulous individuals with normal speech and persons with a variety of different tooth arrangements, occlusion, arch form and size, and vault form and height. A comparative analysis of the palatograms indicated that no two persons contact the same areas in the production of a given consonant.

Age and Sex: Tanzer¹⁶ investigated the upper anterior teeth in men and women. Forty-eight enlargements of photographs of the teeth were displayed and judged by a group of dentists. The correct sex was recognized in 60 per cent of the cases. Horowitz et al.¹⁷ studied mesiodistal tooth dimensions in like sexed Caucasian twins. It was observed that genetically conditioned variations of a highly significant nature occur in 8 of the 12 anterior teeth. In general, the canine teeth exhibited the lowest hereditary relationship. The authors concluded that there is a relationship between sex and the variations observed in the maxillary left central incisor, mandibular left canine, and all lateral incisor teeth. Arno and his associates¹⁸ investigated the relationship of sex and other factors to gingivitis in a series of 1200 persons employed in a manufacturing plant in Oslo, Norway. They concluded that sex and gingivitis show no cause and effect relationship. Miyagawa and his colleagues¹⁹ studied 214 jaw fractures at the Tokyo Medical and Dental University during the period April 1934 and February 1957. They noted that jaw fractures occur much more often in the male sex. Miles²⁰ observed that, when dental and bone age correspond closely, the sex is probably male. In contrast, if the bone age exceeds the dental age, the subject is probably female.

History: Collins²¹ reviewed the etiology and nature of dental pain. Elfenbaum²² pointed out the diverse origins for odontalgia. Particular attention was given to angina pectoris and bacteremia. The problem of dental pain resulting from galvanic currents was studied by Phillips.²³ He observed that a cement base will not insulate the pulp from such currents. Ryan²⁴ evaluated facial pain and made the point that trigeminal neuralgia is usually so typical and so excruciating that it generally poses no great diagnostic problem.

Personality: Greenblatt²⁵ analyzed pain of nonorganic origin and pointed out the psychologic factors which may influence pain threshold. Manhold²⁶ attempted to delineate the personality factors which are associated with dental caries development. Himler²⁷ made a plea for the diagnostician to learn to distinguish between the patient's perception of pain and his reaction to it. Traisman and Traisman²⁸ studied thumbsucking in 2650 infants and children selected in consecutive order from a pediatric practice. The authors contended that the thumbsucking problem has been overemphasized and parents unduly alarmed.

Temperature: Shapiro and Ershoff²⁹ measured the temperature of normal and inflamed teeth and gingiva. It was found that gingival temperature was higher during inflammation and that the temperature decreased with subsidence of the inflammation.

Examination of the Head and Neck

The examination of the head and neck includes *nine* categories: (1) *size and shape of the head*, (2) *skin*, (3) *hair*, (4) *facial swelling and asymmetry*, (5) *temporomandibular joint*, (6) *ears*, (7) *eyes*, (8) *nose and paranasal sinuses*, and (9) *neck*. Not all of these items received attention during 1958.

Size and shape of the head: Tanner³⁰ pointed out how previous studies have made it possible to predict bicanine distance at age 8 by determination of this measurement at age 4. He applied general growth characteristics and pointed out how these characteristics could be utilized in orthodontics to establish growth patterns of the head and the dental arches.

Facial swelling and asymmetry: Harrigan and his coworkers³¹ described a case report of a 26-year-old male with a chief complaint of left facial swelling of 3 years' duration which proved to be a cavernous hemangioma. Riley et al.³² described a 5-year-old patient with familial fibrous dysplasia. They underscored the observation that familial multilocular cyst formation seems to parallel the start of root resorption of the primary teeth. Pfeifer³³ outlined the story of a 67-year-old male with facial swelling as the result of metastases from a hypernephroma. Horowitz³⁴ discussed the general problem of angioneurotic edema and included four cases.

Temporomandibular joint: Reitman³⁵ analyzed the most common sequence of events leading to temporomandibular joint pathosis. Apparently, according to this author, there is first an interference with normal reflex coordination resulting in clicking, shifting of mandibular movement and/or dislocation. All of these changes lead to muscle spasm and the initiation of a vicious cycle. Bennett³⁶ contended that no single fixed center exists from which rotation of the mandible occurs. Goldblatt³⁷ investigated the three-dimensional positional relationship of the condylar head and the glenoid fossa in adult skulls. The results of the study demonstrated a significant parallelism of the curved planes formed by the articular surfaces in some of the areas.

Costen³⁸ analyzed the locations of pain secondary to temporomandibular joint pathosis and the nervous pathways which are presumably implicated. Hankey³⁹ reviewed 100 treated cases of temporomandibular joint dysfunction. The author believes that the ear symptoms, except for pain, described by Costen do not exist. However, he did make the point that the neuralgias are common and important. Murphy⁴⁰ examined 100 patients with excessive loss of vertical dimension and a lifelong habit of tobacco chewing. Only 4 per cent of the patients had any symptoms. The author concluded that loss of vertical dimension is rarely a factor in the production of temporomandibular joint syndrome when cusp interference is not present. Shore⁴¹ indicated the great need for an examination and evaluation method for temporomandibular joint dysfunction and included a suggested plan.

Ears: Silcox,⁴² in a report reviewing otorhinolaryngologic problems of interest to the dentist, emphasized the intimate anatomico-physiologic relationships of the temporomandibular joint and the structures of the external and middle ear and the eustachian tube.

Eyes: Skalska and Wachowiak⁴³ examined 2000 patients with eye diseases to attempt to establish the possible connection between eye infections and dental foci of infection. In 1000 patients with noninfectious diseases, the presence of dental foci of infection was just as commonly observed as in another 1000 patients with infectious eye problems. Stanworth and McIntyre⁴⁴ also investigated the causative factors in eye infections (uveitis) in 237 patients. They observed a strong association between dental foci of infection and granulomatous anterior uveitis.

Nose and paranasal sinuses: Meredith et al.⁴⁵ observed, in a group of 55 children aged 4 to 12, that the nasal

component increases in parallel with the subnasal component. They also noted, in a group of children treated by orthodontic means, that after bite-opening procedures are instituted, there is a temporary increase in subnasal height.

Neck: Neumann⁴⁶ indicated the need for the early determination of the exact nature of enlargements of the cervical lymphatic system.

Examination of the Oral Cavity

The appraisal of the oral cavity includes ten categories: (1) *breath*, (2) *lips*, (3) *buccal mucosa*, (4) *saliva*, (5) *gingiva*, (6) *tongue*, (7) *sublingual space*, (8) *palate*, (9) *pharynx and tonsils*, and (10) *teeth*. Not all of these items received attention during 1958.

Lips: Fuchs⁴⁷ discussed a 17-year-old girl with labial discolorations due to a lipstick allergen.

Saliva: Krasse and Gustafsson⁴⁸ examined saliva obtained from the same group of persons 5 minutes after chewing paraffin wax and chewing gum at and between meals. They observed that carbon dioxide was higher and salivary phosphorus lower at mealtime than in between meals. Kerr⁴⁹ presented data to show the relative contributions of the major salivary glands with results obtained from experiments following minimal stimulation, psychic, visual, olfactory, gustatory and masticatory excitation.

Gingiva: Morris⁵⁰ discussed the position of the margin of the gingiva. Particular attention was directed to the pocket. Emslie⁵¹ analyzed the etiologic factors leading to gingival recession localized to one or a few teeth in terms of direct and occlusal trauma, high frenum attachment, shallow labial sulcus, and the presence of calculus. The author indicated that the evidence is inadequate to indict occlusal trauma as an initiating factor in gingival reces-

sion. Hutchinson⁵² investigated the reliability of the P. M. A. index in a group of 10-year-old school children. This researcher found the index to be more adequate for epidemiologic purposes than for single cases or small groups. Kreski⁵³ reemphasized the point that the earliest signs of the periodontal diseases include gingival change in color, texture, and consistency. Lovdal et al.⁵⁴ studied a random sample of 1202 male employees of a manufacturing plant in Norway. It was noted that the principal clinical manifestations of periodontal diseases are observed most frequently on the interproximal and lingual surfaces. Mesrobian⁵⁵ reemphasized the importance of unreplaced missing teeth as a factor in the genesis of periodontal pathosis. Sanjana and his group⁵⁶ studied 608 Indian school children. They discovered a very close correlation between tartar and tooth malposition. Zander⁵⁷ reiterated the point that the clinical response to calculus is a change in gingival color and form. Ross and his colleagues⁵⁸ studied the effect of various types of experimentally inflicted mechanical trauma upon the oral tissues of 11 patients with histories of recurrent ulcerative stomatitis. They concluded that aphthae may be the result of one or more precipitating factors superimposed upon a mucosa of limited recuperative or defensive potential. Waerhaug⁵⁹ feels certain that supra- and subgingival bacterial deposits are the most important single cause of the periodontal diseases. Massler⁶⁰ examined 10,000 Chicago and 40,000 Philadelphia children to determine the prevalence of gingivitis. He analyzed the data in terms of age groups, type and course of gingivitis, and the etiologic factors. Stahl⁶¹ reviewed briefly the periodontal changes commonly encountered with trauma due to abnormal occlusal forces. Also included in the report is a summary of

some of the interrelated factors which operate in the development and the maintenance of the periodontal lesion. Kutzleb⁶² investigated 427 pregnant women and concluded that hormonal factors can be regarded as the primary cause of the gingival pathosis. Lighterman and Lees⁶³ reviewed the literature regarding the etiology of gingival hyperplasia associated with pregnancy. They concluded that the etiologic frame is a complex interaction of a number of vitamin and hormonal imbalances in combination with periodontal irritation. Rohackova and Ticha⁶⁴ also studied gingival changes during pregnancy in 187 pregnant women at the University of Brno, Czechoslovakia. They observed that gingival changes usually begin during the second and third gestational month and persist for several months into the postpartum period. Pliess and Bornemann⁶⁵ studied 321 denture wearers who complained with sore spots. In 25 cases the clinical examination showed leukoderma. Four of these cases proved to be malignant. Reither⁶⁶ contended that the requirement for pantothenic acid is probably greater than the need for other vitamin B complex fractions in the maintenance of oral health in denture wearers. Sud⁶⁷ described a case of extensive naso-oral inflammation with chronic suppurative periodontitis associated with a clinically evident vitamin A deficiency state. Miller and Greene,⁶⁸ in a preliminary report, indicated their plan to accumulate data on a worldwide basis regarding acute necrotizing ulcerative gingivitis.

Tongue: Wooldridge⁶⁹ performed a clinical study designed to relate various tongue movements to mandibular arch asymmetry. He found that there is a relationship between the ability to twist the tongue in one direction only and asymmetry of the mandibular dental arch. Adams⁷⁰ cautioned that the

presence of glossitis should alert the examiner to the possible etiology of pernicious anemia. Argunova⁷¹ examined postmortem material from 15 subjects of whom 10 had died with dysentery, 1 from toxic infection, and 4 from infections hepatitis. The author claimed that 70.5 per cent of the changes in the appearance of the tongue have diagnostic importance in the evaluation of gastro-intestinal diseases. Plotnick and Cerri⁷² noted that the most common oral site for the granulomatous lesions of histoplasmosis is the tongue.

Palate: Most of the literature has been concerned with the cleft palate problem. Posen⁷³ compared vertical mandibular body height and occlusal height in unilateral and double cleft patients and noncleft individuals. It was discovered that, in the unilateral cleft case, the anterior portion of the mandible on the cleft side is significantly greater than the contralateral side. Mazaheri⁷⁴ examined the case records of 671 patients at the Lancaster Cleft Palate Clinic. He observed that males are more often afflicted with congenital cleft palate. He also noted that cleft palate was positively related to birth rank and to maternal age. Ferenczy⁷⁵ studied the relationships of alveolar clefts to the fusion of the premaxilla with the maxilla. Two pertinent reports of a noncleft nature appeared during the year. Morgan⁷⁶ pointed out that an early clinical finding of a median anterior maxillary cyst is palatal swelling just lingual to the maxillary incisor teeth. Caird and Holt⁷⁷ reported on 200 patients in whom glandular fever was a diagnostic possibility. In the 28 patients with proved glandular fever, all had some palatal petechiae. They further noted that, if fewer than 5 petechiae are present, there is still a strong suspicion of the disease. Kessler⁷⁸ emphasized the point that the contour and thickness of the palate, or den-

ture, just lingual to the upper anterior teeth is more important to the English-speaking patient than it is to one who speaks a foreign tongue.

Teeth: The dental tissues have received considerable attention during 1958. The articles may be classified in the following categories: (1) *eruption*, (2) *arrangement*, (3) *malformations*, (4) *pigmentations*, (5) *deposits*, (6) *dental caries*, (7) *inflammations*, and (8) *mobility*.

Eruption: Three reports appeared during 1958 dealing specifically with eruption of the primary teeth. Allwright⁷⁹ presented 26 cases of natal and neonatal teeth in Chinese subjects from Hong Kong. In only one instance could the teeth be regarded as predeciduous. The various general and local etiologic factors were discussed. Ferguson et al.⁸⁰ undertook a study to compare the eruption time of the first primary tooth and the number of teeth present at one year of age in a group of 808 Negro and 175 white infants. The eruption age of the first tooth is earlier for male and female Negro infants than it is for white children in a sample from the middle socioeconomic level. Hoffer⁸¹ observed normal eruption of primary teeth in a group of infants who had not been bottle- or breast-fed. He concluded that the functional stimulus claimed to be necessary for normal development need not be present for physiologic eruption of the primary dentition. Most of the 1958 publications were concerned with the entire permanent dentition or single or groups of teeth. Hargreaves⁸² analyzed the time required for the various permanent teeth to erupt. He observed 9 weeks on the average for the incisors, 12 weeks for premolars, and 10 to 14 weeks for molars. The eruption time was investigated in 7854 Chinese children between the ages of 5 and 15 years.⁸³ There were no significant sex differences. In general, the lower teeth

erupted before the maxillary teeth with the exception of the premolars. Clements and his co-workers⁸⁴ examined the eruption schedule of the permanent teeth in English children attending independent, rural and urban schools. The only significant correlation observed was that the second primary molar was retained longer in children attending independent and rural schools. Fogels and Shere⁸⁵ observed the eruption of the first permanent molar. The average emergence age was 6 years 9 months for the maxilla and 6 years 7 months for the mandible. Full or complete eruption was not completed until 7 years 4 months and 8 years for upper and lower first molars respectively. Silverman⁸⁶ described a 7-year-old boy with a chief complaint of delayed eruption of the permanent maxillary left central incisor and retention of the primary left central incisor. A final diagnosis of a complex odontoma was made. Szabo⁸⁷ noted that the treatment of chronic tuberculosis in children with tuberculostatic agents does not alter the eruption or development of the teeth. One article dealing with secondary eruption appeared in the literature. Bruszt⁸⁸ reported a case in which the 4 maxillary incisors of a 9-year-old boy were intruded into the maxilla by a blow in the long axis of the teeth. Spontaneous eruption took place 10½ months later.

Arrangement: Two articles appeared concerned with occlusion following extraction of teeth. Frumkina⁸⁹ studied 149 children to determine the position of second premolars and second molars after first molar extraction. He concluded that the least shifting of teeth occurs when the unsavable first permanent molar is extracted after the premolars have already erupted and while the second molars are in the process of eruption. Smith⁹⁰ surveyed 113 orthodontic cases. He noted the final posi-

tion of the third molar after extraction of the second molar for orthodontic purposes. The investigator concluded that the upper third molars, almost without exception, erupt into a favorable position. The mandibular third molar seems to exhibit a wider range of final positions. Bruszt⁹¹ reported a case with two mandibular canines on one side and none on the other. By means of inferior block anesthesia he was able to demonstrate that one of the canines had drifted across from the contralateral side. Noyes⁹² discussed the genetic influence on malocclusion in a well-written review. Brodie⁹³ also considered the hereditary factors in the genesis of malocclusion but also emphasized the factors of time and order of dental eruption, time, rate, and duration of growth and the interrelations of these various factors. Kawamura and Nobuhara⁹⁴ allowed 16 persons with comparatively good occlusion and 22 persons with various kinds of abnormal dentitions to chew and swallow five pieces of peanuts. He recorded the number of chews and the time in seconds required for this physiologic act. Generally speaking, subjects with malocclusion took longer to masticate and chewed many more times than those with normal occlusion. Bober⁹⁵ observed 4000 persons between the ages of 25 and 40 at the Institute for Research on Human Physique and Physical Characteristics at the University of Heidelberg. It seemed of interest that bruxism occurred more frequently in men and bruxomania more often in women. The data obtained seem to indicate that a definite relation exists between bruxism or bruxomania and the presence of malocclusion. Craddock⁹⁶ attempted to disprove the concept that, as the morsal surfaces of the teeth are worn off, the resultant reduction in vertical dimension is compensated for by passive eruption of the

teeth. Leech⁹⁷ indicated that most increased incisor overbites are not due to mandibular overclosure. Rather, according to this investigator, the problem is one of abnormal incisor relation. Benson⁹⁸ studied occlusion serially in a group of 82 children. He observed caries-free mouths were more likely to be associated with normal occlusion. He also claimed that thumbsucking is the main single cause of malocclusion.

Malformations: Hals⁹⁹ reported the story of two families with hereditary enamel hypoplasia. Album¹⁰⁰ presented a case of taurodontia, a rare anomaly of molars in which the body of the tooth is enlarged at the expense of the roots. LeGwin and Warren¹⁰¹ pointed out that Hutchinson incisors and mulberry molars need not be the result of congenital syphilis. Wallenius¹⁰² compared the width of teeth and the fluoride content of the drinking water in 419 Swedish school children. The evidence suggested that a relationship does exist.

Pigmentations: Ata¹⁰³ examined 1800 children between the ages of 7 and 8 and 799 children aged 12 to 14 years. They observed in this Turkish population that 50 per cent of the children showed clinical evidence of fluorosis. Grahnen and Larsson¹⁰⁴ investigated the presence of hypoplasia in the primary dentition of prematurely born children as compared with normal children. They observed a higher incidence of enamel hypoplasia in the prematurely born children. Wagenbichler¹⁰⁵ analyzed the teeth of 400 children on the island of Isehia. Enamel defects were observed either in all of the teeth or in groups of teeth (e.g. incisors). The author felt that there is a definite relationship between the intake of radioactive drinking water and the development of enamel defects. An investigation of the tooth structures of inhabitants of the fluoride-rich regions of the U. S. S. R. was conducted by

Schmidt.¹⁰⁶ It was found that children living in areas of high fluoride content (10 to 12 ppm) in the drinking water had mottling and irregular patches of white or brown pigmentation on the tooth surfaces.

Deposits: Leung and Jensen¹⁰⁷ reviewed the etiologic factors in calculus formation. They contributed the recent information that the cuticle on the tooth surface, as well as the filamentous microorganisms, probably plays an important role in the formation of calculus.

Caries: Various reports of an epidemiologic nature have appeared during the past year. Some of these have been of a general tenor. For example, Knutson¹⁰⁸ analyzed ten dental surveys in nine different communities. The author showed a high positive correlation between DMF teeth and DMF tooth surfaces. On the other hand, specific surveys were reported. Miller¹⁰⁹ examined the teeth of children in representative white schools in 8 Alabama counties. Only the teeth of 6, 7, 8, and 14-year-old children were examined. The prime purpose of the study was to establish age-specific decay rates for white Alabama children as a baseline for future evaluation of subsequent dental health programs. Children were inadvertently included from a school where the community drinking water contains 1.4 ppm fluorides. The DMF and def rates were much lower in this particular community. Cohen¹¹⁰ investigated 200 seventh grade children aged 11 to 14 in Salem, Massachusetts. High DMF rates, gingival inflammation, and enlargement were observed. Hill et al.¹¹¹ compared the permanent teeth dental caries experience rates in 1947 and 9 years later in a fluoride-free area. They found no statistically significant change in the dental decay status over the 9 year period. Several caries studies were reported outside of

the Continental United States. Neumann and DiSalvo¹¹² observed remarkably little caries among Otomi Indians which could not be ascribed to good oral hygiene, good diet, fluorides or low carbohydrate intake. These same investigators in another report¹¹³ described the low DMF prevalence in a number of different Indian groups in Mexico and South America. They observed that the only common denominator in their highly varied diets was the presence of natural versus refined foods. Ostrosky¹¹⁴ studied 206 children aged 6 to 15 years in a remote area of Chile Chico and reported a DMF prevalence of 5.7 for the children under 10 and 3.6 for those in the age group 11 to 15. Melanby et al.¹¹⁵ surveyed London County Council day school children, aged five during 1955 and compared the findings with those obtained in a series started in 1929. They observed less tooth decay in 1947 than in any other year. They also commented on the fact that 1955 showed the greatest caries incidence since 1943. They attributed the low 1947 rate to the maternal nutrition during the war years and especially to the calcium-rich foods recommended to expectant mothers. Birmingham¹¹⁶ reported the DMF rates of first permanent molars in 1500 children, aged 6 to 12, in the Waterford County Borough area of Ireland. In Troms County, Norway, 1159 children aged 7 to 15 were examined in 1956 by Hougén.¹¹⁷ He observed a very high caries prevalence, high rate of extracted missing teeth, and a low rate of filled teeth. Serrano¹¹⁸ commented on the high DMF rate in 222 preschool children, 716 school-age children, and 237 persons above the age of 15 in Davila, Chile. Grodzka and his coworkers,¹¹⁹ from a study of 5055 Polish kindergarten pupils aged 2 to 6 years, pointed out that 10 per cent of the teeth were carious. Hertz¹²⁰ studied 182 Koreans

living on an isolated island off the west coast of South Korea. He observed a very low DMF rate. Caries frequency and DMF index were determined by clinical examination by Novotny¹²¹ in 508 Korean children living in Czechoslovakia. He then compared them with 399 Czech children and found that carious teeth were present in 48.8 per cent of the Korean children and in almost 90 per cent of the Czech children. The caries experience was also higher in Czech-born Koreans than in Korean children born in Korea. Desai and Singh¹²² analyzed the incidence of dental disease in 1053 male adults aged 16 to 50 years in the Bombay suburbs. The percentage of carious lesions was low, and it was observed that extraction was generally due to periodontal pathosis. A study of the decay pattern of 2281 boys and 709 girls in Lucknow schools in India was made by Chaudhry et al.¹²³ It was observed that the primary teeth were more often involved with caries than the permanent dentition. Four articles appeared during 1958 regarding nutrition and dental caries. Cohen and Rubin¹²⁴ noted the inhibitory effect of pyridoxine lozenges upon dental caries in a fluoridated area. The conclusion was drawn that there is presumptive evidence of caries suppression by pyridoxine. Streat and his colleagues,¹²⁵ in a human study involving 28 children between the ages of 10 and 15, observed a 40 per cent reduction in dental caries with the use of pyridoxine lozenges taken for a one-year period. Toverud¹²⁶ commented on the lower caries attack rate in Norwegian preschool and school children during the war years. They attributed the change to sugar rationing. Bruszt¹²⁷ concluded, from a study of 620 children in Baja, Hungary, that the administration of vitamin D had significant effect upon caries experience. MacLaughlin et al.¹²⁸ analyzed caries incidence and

dental care of the first permanent molar by surfaces at yearly intervals in a group of 401 subjects between the ages of 5½ and 10½. An analysis was made of the time delay between occlusal and interproximal caries which suggests, from a public health standpoint, restoration of proximal surfaces at the time occlusal restorations are placed. Aghmedov¹²⁹ observed 800 children including 400 controls, 200 with malaria or having suffered with it and 200 living in a malaria ridden area. The caries experience was found to be greatest among those who had had malaria and least in the control group (non-malaria area). It was also felt that caries experience was greatest in those with malaria for a long period of time. Finally, it appeared that malaria patients showed delayed eruption of the teeth. Slack and his co-workers¹³⁰ studied variability in the recognition of carious lesions. They claim fairly homogeneous results when they establish practical standards and use a standard replaceable probe point. All preschool and school children residing in 8 communities about Berlin, Germany, were examined by a group of physicians, dentists, and public health officers. Hoffman-Axthelm¹³¹ reported the caries reducing result of fluorides as well as the possible effect of two other elements (calcium and magnesium).

Tooth Mobility: Parfitt¹³² described an instrument still under construction designed to measure slight alterations in tooth deflection under loads up to 5 pounds. Tooth mobility of a magnitude of 75 to 105 micrometers per pound have been observed in upper incisor teeth. Two studies appeared in the literature dealing with tooth mobility and periodontics. Forsberg and Hagglund¹³³ studied tooth mobility changes after various types of periodontic therapy. Treatment with ultrasonic radiation produced no change.

Gingival massage was followed by reduced tooth mobility. Flap operations and gingivectomies were not effective in reducing tooth mobility. Combined therapy (operation plus gingival massage plus grinding) was successful. However, it was observed that, though tooth mobility may be reduced in a tooth which is ground, there may result increased mobility in its antagonist. Muhlemann et al.¹³⁴ believe that tooth mobility is the result of occlusal trauma. By means of the Muhlemann periodontometer, Probst¹³⁵ is presently studying tooth mobility in relation to orthodontic movement. However, a final report is still not available.

Roentgenographic examination

In addition to studies of a purely clinical nature, roentgenography has contributed to the literature on oral diagnosis during 1958. The studies may be divided into six categories: (1) *technique*, (2) *contrast*, (3) *density*, (4) *calcification*, (5) *jaw position*, and (6) *roentgenographic diagnosis*.

Roentgenographic Technique

Parma¹³⁶ reviewed developments in dental roentgenography and discussed microradiography, Omnell's microphotometry and radiocephalometry. Driak and Langer¹³⁷ by means of a roentgenoscope (an instrument for studying structural changes by means of fluorescent screens excited by roentgen rays) claimed that it is possible to detect foci of infection at the apices of teeth inadequately treated by endodontic means. Poyton¹³⁸ described a technique employing intraoral, occlusal, and extraoral projections for identifying third molar position. Paatero¹³⁹ discussed in general terms the principle of pantomography. He reiterated the point that this roentgenographic technique is based on the fact that a moving film

picks up a sharp record only of that layer of a rotating object which is moving with an equal linear velocity to the film. Nitsehe and Valyi¹⁴⁰ recommended the method of comparative roentgenography as the preferred technique for visualizing the anatomic features of the condyle and glenoid fossa. In another article¹⁴¹ these same authors discussed a method for the localization of the impacted maxillary canine. Lindblom¹⁴² reviewed the status of cineradiography and discussed both cineradiography and cinefluorography. He pointed out the contributions of cinefluorography in the investigation of the chewing process, the behavior of prosthetic appliances and temporomandibular joint movements. A parallel technique for roentgenography of the alveolar crest was suggested by Harndt.¹⁴³ He pointed out that it is possible to take serial roentgenograms of exactly the same projection. A study of 34 children utilizing headfilms, plaster models, and intraoral roentgenograms was undertaken by Foster and Wylie.¹⁴⁴ This investigation showed that arch length can best be predicted by intraoral projection techniques. Freese¹⁴⁵ has adapted the long cone technique for temporomandibular joint roentgenography. Budovsky and his group¹⁴⁶ analyzed a questionnaire to ascertain the office roentgenographic techniques currently employed by dental practitioners. The survey indicated that the short cone technique is much more popular than the long cone procedure. Kydd¹⁴⁷ pointed out that the rapid cassette changer will permit the exposure of six 11 × 14 inch roentgenograms per second. He felt that this technique, together with the cephalometric head holder, makes for a satisfactory method of studying mandibular movements. It was recommended by Heckmann¹⁴⁸ that bivisual roentgenograms be employed for the diagnosis of complicated dental conditions.

Calcification

Garn et al.¹⁴⁹ studied tooth calcification in serial oblique roentgenograms of 255 white persons, aged 1 to 25 years, from southwestern Ohio. In general, he reported that tooth calcification in girls appears earlier than in boys.

Contrast roentgenography

Applebaum¹⁵⁰ cut blocks out of human jaws and then examined the material by hard and soft x-rays and histologically. He observed that variations in roentgenopacity in alveolar bone not quite visible in the usual clinical roentgenograms are demonstrable when the sections are studied with grenz rays. Neufeld¹⁵¹ claimed that the roentgenogram is as effective in revealing bone architecture as ground and decalcified sections. Staffieri¹⁵² studied the different arrangements of alveolar trabeculae in the mandible. He concluded that each person has a characteristic pattern, persons with a transverse pattern have greater resistance to osteoclasia and periodontal pathosis, there are no sex differences, round patterns are common in those of the Mongolian race and irregular patterns occur more often in the Negro. Einstein and Perzik¹⁵³ compared clinical and surgical findings with parotid sialography in 70 patients. They concluded that sialography is a useful tool in distinguishing between extrinsic and intrinsic space-occupying masses in the parotid area.

Jaw position

Tracings of 20 cases with normal occlusion and 40 Class II, Division 1 occlusions were analyzed by Martin.¹⁵⁴ The study showed that the area from the anterior nasal spine to the incisal edge of the maxillary central incisor was more inferior and anterior in the distocclusion cases. Also it was noted that the mandibles of patients with dis-

toclusion are smaller and more distally placed. Yippo¹⁵⁵ developed film strips based on profile roentgenographs showing that the physiologic rest position in phonetics corresponds to the physiologic dental position. He demonstrated the different positions of the speech organ for Finnish vowels and consonants. Wildman¹⁵⁶ studied the relationship between nasal emission of air during speech and the efficiency of the velopharyngeal valving mechanism in cleft palate individuals. Nasal emission was measured by a nasometer designed specifically for this study. The movements of the soft palate and the posterior pharyngeal wall were recorded from tracings of lateral cephalometric roentgenograms taken during inhalation and during vowel phonation. The evidence from these studies indicated that the soft palate plays an important role in the control of nasal emission by the cleft palate patient. Smith¹⁵⁷ examined the position and movement pattern of the hyoid bone with lateral cephalometric roentgenograms during jaw movements.

Roentgenographic diagnosis

Blaeharsh and his co-workers¹⁵⁸ examined the roentgenograms of 169 male patients aged 20 to 49 years in a Veterans Administration Hospital in New York City. It appeared to these investigators that the only correlation was one of age and alveolar bone loss. A cephalometric study of alveolar process height was made in 30 individuals, aged 4 to 20, by O'Meyer.¹⁵⁹ Measurements showed sex differences and variations in different areas. In six cases which had received orthodontic treatment, alveolar growth was greater. Lynch¹⁶⁰ described a case report of a three-month-old negro male in which there was roentgenographic evidence of periosteal elevation of the ramus of the right mandible in whom the final diagnosis

proved to be infantile cortical hyperostosis. Raczew¹⁶¹ examined clinically and by bitewing roentgenography 24,000 school children 6 to 14 years of age. He observed, in this sampling of children in the Dental Clinic of the University of Warsaw, Poland, that almost 60 per cent of the interproximal carious lesions would have remained undiscovered without bitewing examination. Fink and Schmidt¹⁶² also observed, from a study of 678 men in a clinic located in Bad Hersfeld, Germany, that 55.6 per cent of these men had carious lesions missed by clinical examination and detected by bitewing roentgenography. Blum¹⁶³ discussed, by way of case reports, the important role of roentgenography as an aid to oral diagnosis. Aram¹⁶⁴ studied velopharyngeal function and age in 90 subjects (4 to 20 years) by means of lateral cephalometric roentgenography during rest and during the phonation of the *oo* sound. It appears that the soft palate moves upward and backward with the production of this sound. Also, it was observed that the movement of the soft palate increases with age when *oo* is sounded. Benediktsson¹⁶⁵ studied the variations in tongue and jaw position in 246 patients prior to orthodontic treatment at the Royal Dental College in Copenhagen. Specifically, he analyzed by roentgenographic means the relationship of the occlusion of the incisor teeth to the position and movement of the tongue during the production of the *s* sound. It was observed that incisor malocclusion was compensated for by tongue and jaw movements to obtain a position most favorable for the production of this sibilant. The action of the muscles of the tongue was studied teleoroentgenographically in 24 children with normal occlusion and 37 children with distocclusion by Holik.¹⁶⁶ The author maintained that there is a definite relationship between

habitual mouthbreathing and neuromuscular development of the tongue. He added that tongue maldevelopment may be a major causative factor in the genesis of distocclusion. Moss¹⁶⁷ demonstrated, from a study of 80 white patients with cleft palates and 354 white and Negro noncleft patients, that premature synostosis of the frontal suture occurs three times more frequently in the cleft palate patients. It was the recommendation of Smith,¹⁶⁸ after a study of two cases of scleroderma, that diagnosticians become aware of the importance of periodic dental roentgenographic examination in the detection of this disorder. Lovstedt¹⁶⁹ discussed, in general terms, systemic diseases which are associated with oral roentgenographic changes.

Laboratory studies

A number of reports concerned with laboratory techniques appeared in the literature during 1958. These may be classified as follows: (1) *chemical studies*, (2) *reports of a histochemical nature*, (3) *histopathology*, (4) *electromyography*, (5) *microbiologic reports*, (6) *reports on arch form and muscle forces*, (7) *pulp testing*, (8) *allergy and other stress reactions*, and (9) *miscellaneous reports* not otherwise classifiable.

Chemical studies

Reports of a chemical nature are conveniently divided into four categories: (1) *blood*, (2) *urine*, (3) *saliva*, and (4) *miscellaneous*.

Blood reports: Burrill and his associates¹⁷⁰ investigated 150 subjects with no roentgenographic evidence of bone loss versus 70 with alveolar bone loss. Except for the blood cholinesterase, there were no consistent differences in blood values between the two groups. Engel et al.¹⁷¹ observed elevated levels

of a serum glycoprotein fraction in 40 per cent of a group of patients with periodontosis. The authors postulated that this blood finding is one more fragment of evidence that periodontosis is intimately related to a general connective tissue reaction.

Urinary reports: Chaput and his group¹⁷² studied seven juvenile subjects with periodontal disease. The usual blood calcium studies were within normal limits. However, calcium perfusion studies indicated greater calcium loss in the urine than would ordinarily be expected.

Salivary reports: Several studies concerning saliva were of a general nature. Pigman and Hawkins¹⁷³ investigated the reducing power of saliva. They reported that the reducing substances of the salivary secretions are probably a heterogenous mixture of various carbohydrates, proteins, glycoproteins, and some small molecular weight materials. Berggard and Werner¹⁷⁴ observed that normal human saliva contains two main kinds of glycoprotein, one being neutral and the other an acid. Both are normally found in epithelial mucous secretions. The neutral glycoprotein, a fucosamin, is predominant in mixed human saliva. It is suggested that the development of dental caries might be influenced by an increased liberation of the acid glycoprotein. Electrolyte concentrations of submaxillary and parotid secretions were compared by Henriques and Chauncey.¹⁷⁵ It was found that submaxillary saliva contained greater amounts of calcium, and concentrations of sodium, potassium, bicarbonate and phosphate were larger in parotid secretions. Dreizen et al.¹⁷⁶ compared the buffer capacities of saliva and serum. In every case the buffer capacity of serum exceeded that of saliva in the pH range tested (6.0 to 7.0). Other investigators considered certain aspects of saliva in relation to dental caries. Eng-

lander et al.¹⁷⁷ studied dental caries activity in relation to the pH, titratable alkalinity, and rate of flow of parotid saliva. No difference in these aspects of saliva was noted in persons with rampant caries versus caries-free subjects. Englander and Weber¹⁷⁸ found that the mean chloride concentration of parotid saliva was significantly greater in persons with rampant caries than in caries-free individuals. However, the authors felt that there was too much overlapping between the groups to use this as a test for caries activity. The sodium, potassium and chloride concentrations of mixed saliva were determined by Shannon.¹⁷⁹ He investigated persons whose dental status was classified as carious, restored or resistant. It was observed that the sodium and chloride levels were lower in the resistant group. Rovelstad and co-workers,^{180,181} in a two-part article, attempted to establish a relationship between the hyaluronidase activity of saliva and dental caries experience, gingivitis and oral hygiene. Hyaluronidase activity was found to have no relationship to caries experience, but hyaluronidase activity did relate to gingivitis and oral hygiene. In another report Rovelstad et al.¹⁸² noted that there is a direct relationship between salivary lactobacillus count and dental caries and between acid-producing ability of saliva as determined by the Snyder test and caries experience. Kraus et al.¹⁸³ investigated certain aspects of saliva and their relationship to periodontal disease. They observed significant differences in the catalase and peroxidase values of healthy versus periodontally diseased subjects.

Miscellaneous reports: Dunbar and associates¹⁸⁴ reviewed studies in the literature concerned with a skin test designed to measure ascorbic acid status in human beings. It was concluded that the test, utilizing the intracutaneous

injection of 2,6 dichlorophenolindophenol, was most reproducible when a dye concentration of N/300 and a wheal size of 4 mm. were used. It was further concluded that 90 seconds is the irreducible disappearance time for the dye. In another report¹⁸⁵ these same investigators studied the intradermal ascorbic acid test in their own series of 42 dental students. They noted that the plasma ascorbic acid concentration was related to the intradermal decolorization time. They also observed that the intradermal test was significantly related to tobacco consumption and citrus intake.

Histochemistry

There were two reports in the literature dealing with histochemical studies. Cabrini and Carranza¹⁸⁶ examined normal and inflamed gingiva in 10 patients for acid phosphatase. It was found that this enzyme is located almost exclusively in the epithelium. Engel¹⁸⁷ stressed the fact that the lability of the biologic behavior of connective tissues is related to its physicochemical properties.

Histopathology

Reports of histopathologic studies were numerous. For convenience these reports have been categorized as: (1) those concerned with the *cytology of intra-oral smears*, and (2) those employing *biopsy* as a means of study.

Smear cytology: Exfoliative cytology received the attention of at least six groups of investigators during 1958. Trotti¹⁸⁸ studied the desquamative cytology of gingiva and oral mucosa through a number of consecutive menstrual cycles in eleven normal women. He observed no evidence of a cyclic pattern related to the menstrual cycle. Cooke¹⁸⁹ studied the cytologic features of smears taken from oral vesicles caused by herpes simplex and herpes zoster and of smears from similar ap-

pearing vesicles of unknown etiology. The herpetic lesions were found to have specific cytologic features which could not be demonstrated in the nonherpetic vesicles. Using a modification of the Papanicolaou procedure, Silverman¹⁹⁰ attempted to evaluate the usefulness and diagnostic accuracy of intra-oral cytology. It was concluded that this technique is an excellent adjunct to biopsy for the detection of oral cancer. Sandler and Stahl¹⁹¹ studied 51 oral lesions by means of exfoliative cytology and biopsy. The findings by the two methods concurred in 47 instances. It is emphasized that exfoliative cytology is only an adjunct to, not a substitute for, biopsy. An investigation was conducted by Farrant¹⁹² in which smears from the buccal mucosa of normal persons were compared with smears from the same area in patients with pernicious anemia. It was found that the squamous cell nuclei were abnormally large, particularly in the shorter axis, in patients with pernicious anemia. It was further noted that these nuclei revert toward normal when the patients are adequately treated. The leukocytes in saliva were counted by Calonijs.¹⁹³ The sample included healthy persons with and without teeth and persons with an intra-oral inflammatory process. Edentulous persons had the lowest and patients with inflammation had the highest salivary leukocyte counts.

Biopsy studies: Renstrup¹⁹⁴ studied biopsy specimens of 80 leukoplakic lesions of the lips and/or buccal mucosa. The most frequent histopathologic diagnoses were hyperkeratosis and parakeratosis. The investigation was unable to point up any clinical signs which correlated with any microscopic findings. Burch and associates¹⁹⁵ reported a case of hemangioma of the cheek. It was the contention of these authors that tumors of this type occur more frequently along the anterolat-

eral border of the masseter muscle than is generally recognized. A case of mucoepidermoid tumor of the cheek was reported by Hertz.¹⁹⁶ Ostlund¹⁹⁷ studied the changes which occur in the palatine mucosa under a denture. He found that inflamed mucosa under a denture is thicker than noninflamed tissue in nondenture wearers. This increase in thickness of the epithelium is due to an increase in the volume of the individual cells and to edema. He also described the sequence of changes that occurs in the palatine epithelium during the first six months of denture wearing. Seifert and Oehme¹⁹⁸ reported on the pathology of cytophagous inclusion disease, a virus infection of the salivary glands. They established the etiology of the disease as the salivary gland virus, Rabula. From a study of 83 patients they noted the presence of specific giant cells within the inclusion bodies in tissue or body fluids such as saliva. From a study of 186 patients with lympho-epithelial lesions, Bhaskar and Bernier¹⁹⁹ showed that the parotid gland contains true lymph nodes and that parotid and cervical lymph nodes may contain glandular inclusions. They also pointed out that lympho-epithelial lesions are not necessarily confined to the parotid gland. In an earlier report²⁰⁰ these same investigators discussed the histogenesis of branchial cysts. They claimed that 97 per cent of these cysts really represent cystic lymph nodes and arise from the epithelial inclusions within the lymph nodes rather than from branchial remnants. Seifert and Geiler²⁰¹ histologically studied salivary gland specimens acquired from 900 unselected autopsies. In four instances they found salivary gland changes similar to those of Sjogren's syndrome, Mikulicz' disease, and Godwin's lympho-epithelial tumor. The authors pointed out that all of these diseases are associated with

either rheumatoid arthritis, visceral rheumatism, Felty's syndrome or rheumatic arteritis. It is also noted that these syndromes show specific blood and serum protein changes, presence of hemolytic streptococci and an increased antistreptolysin titer. Histopathologic studies of the gingiva were conducted by several investigators. Turesky and co-workers,²⁰² in a study of gingival biopsies from 30 pregnant patients and from nonpregnant females of a comparable age, noted that there was less surface keratinization and more parakeratinization in the pregnant subjects. Wilkins and Vogler²⁰³ studied 81 persons with malignant neoplasms of the gingiva. They could establish no relationship between the wearing of dentures and the development of oral cancer. A histologic study of pulpal calcifications was carried out by James.²⁰⁴ He studied 159 human permanent teeth extracted for orthodontic reasons. Twenty-five of the teeth were unoperated and clinically intact, and 134 were experimentally filled. The prevalence of early calcification was approximately the same in the operated and unoperated teeth. The problem of progressive internal resorption was evaluated by Berning and Lepp.²⁰⁵ They indicated that histopathology and roentgenography may aid in developing new methods of diagnosis of this condition. From a study of 71 human jaws obtained at autopsy, Bolden and Weinmann²⁰⁶ noted the prevalence of fractures in cementum. Sixty-four per cent of the jaws had one or more teeth with one or more cementum fractures, and 11 per cent of the teeth had cementum fractures. Most of the fractures were in the apical third of the root, but the fractures were evenly distributed among the buccal, lingual, mesial and distal surfaces. Hurzele and Zander²⁰⁷ described a method for measuring cementum thickness. They

also established that the cementum of persons over 50 years is about three times as thick as the cementum of individuals less than 20 years. Wais²⁰⁸ microscopically studied 100 periapical lesions. Since it was his observation that only in a very few cases are the lesions cystic, he urged the elimination of apicectomies as a routine procedure in endodontic therapy, especially when the patient can regularly be recalled. Amer²⁰⁹ reported a case of ossifying periapical fibroma. He suggested this name as a generic term to include both osseous fibroma and fibrous osteoma. There were some reports on intrabony lesions not associated with the teeth. A case of hyperparathyroidism involving the mandible was described by Chaudry and associates.²¹⁰ They pointed out the importance of a detailed medical history and blood chemistry analysis in patients suspected of having a giant cell tumor. Kramer²¹¹ also noted that endosteal giant cell lesions must be carefully distinguished from the skeletal manifestations of hyperparathyroidism. He further urged differentiating giant cell tumors from giant cell reparative granulomas. Peracchio²¹² described the findings in eosinophilic granuloma, Hand-Schuller-Christian disease and Letterer-Siwe's disease. He also discussed the treatment and prognoses of these diseases. A similar report was presented by Mellor and Stockdale.²¹³ A case of Paget's disease of bone with osteogenic sarcoma of the maxilla was described by Karpawich.²¹⁴ The findings in Paget's disease were discussed as well as the relationship of this disease to osteogenic sarcoma. There were two histopathologic reports of an unclassifiable nature. Laskin and associates²¹⁵ observed that the rate at which connective tissue ground substance is disaggregated and restored after injection of hyaluronidase is a useful indicator for evaluating connec-

tive tissue disease and the effects of therapy. This conclusion was arrived at after studying the effects of injected hyaluronidase in normal persons and in patients with collagen diseases. Johnson and co-workers²¹⁶ reported a case of actinomycosis of the mandible in a 22-year-old soldier. They noted that aspiration biopsy is invaluable in the diagnosis of any pyogenic fluctuant mass.

Electromyography

Several electromyographic studies were performed during 1958. Greenfield and Timms²¹⁷ described a method of electromyographic study which they would like to standardize. This method employs eight monopolar skin electrodes bilaterally placed on the temporal and masseter muscles. Pruzansky²¹⁸ described an instrument designed to determine the actual energy input in mastication. He considers this a refinement over the more widely used equipment which measures work output of the muscles. Pruzansky and others²¹⁹ observed that the electrical activity of the masseter muscle is always greater on the working side than on the balancing side. It was also found that the ratio of energy input between the working and balancing sides decreases with increased load. Electromyographic records of head position were obtained by Halbert.²²⁰ He found that the post-cervical musculature participates in the maintenance of the erect position of the head as well as in the functions involving the muscles of the anterior region of the head and neck. Rotary movements are accompanied by reactions of the infrahyoid group which stabilize the hyoid bone during such movements. At the University of Freiburg/Breisgau, Germany, Eschler and Paul²²¹ studied the relationship between progressive marginal periodontitis, the tonic level of the vegetative

nervous system and the electrocontractility of the masseter muscles. In 28 hospitalized patients with progressive marginal gingivitis, it was observed that the pathologic course of the disease parallels the course of disturbances in the sympathetically influenced vegetative nervous system. It was also noted that in instances in which an asymmetric localization of acute inflammatory processes in the periodontal tissues exists, the more strongly affected side will show a more pronounced tonic curve than will the less affected side.

Microbiologic reports

An investigation aimed at determining the usefulness of the twelve-hour sensitivity test was conducted by Folsom.²²² From his study of 109 patients he concluded that the use of the twelve-hour sensitivity test resulted in a significantly greater percentage of cases achieving cure in a shorter period of time. He also noted rapid improvement in those who received adequate surgery without concurrent medication.

There were several articles in the literature concerned with the microbiology of saliva. Jackson²²³ studied the oxygen uptake of resting cells in sterile human parotid saliva and compared this to the oxygen uptake by microbes in saliva. The uptake by the cells was always less than that by the microorganisms. They concluded that sterile parotid saliva is not an optimal environment. In a study of 14 adults, Richardson and Jones²²⁴ found that population counts of salt-tolerant micrococci, Neisseria, Leptotrichia, fusobacteria, and hydrogen sulfide-producers proved an index of gingival health. Subjects with higher numbers of one or more of these populations had healthier gingiva and less calculus. Nevin et al.²²⁵ observed that significant amounts of streptococcal growth factors exist in

human saliva. The availability of these growth factors are related to the riboflavin, niacin, pantothenic acid and biotin activity in saliva. Cohen and Collins²²⁶ attempted to establish a relationship between *Streptococcus salivarius* and lactobacilli in saliva. Although the number of lactobacilli colonies showed much more variation between individuals, *S. salivarius* showed more intra-individual variation from day to day and at different times during the day. An investigation was conducted by Bartels and co-workers²²⁷ to determine the factors which limit the establishment of beta-hemolytic streptococci as members of the oral flora. From samples of saliva from caries-immune individuals, Green²²⁸ studied the antibacterial factor which suppresses lactobacilli and streptococci. He indicated belief that this factor is a chemical entity, probably a globulin. Dewar,²²⁹ in a study of gingival debris collected from 38 individuals with normal gingiva and varying degrees of gingival and periodontal disease, tried to relate bacterial enzymes to periodontal disease. Although he found tissue-destroying enzymes of bacterial origin in material from around the teeth, he was unable to determine the importance of these enzymes. Two investigations were concerned with the presence of parasitic protozoa in the mouth. Wantland and Remo²³⁰ obtained scrapings from the teeth and gingiva of 100 patients aged 13 to 70 years. *Endamoeba gingivalis* was found in 50 per cent of the subjects, and *Trichomonas tenax* was demonstrated in 34 per cent of the persons. Eighteen per cent carried both parasites. An attempt was made by Mazzarella and Monsour²³¹ to relate certain oral conditions to infestation with *Endamoeba gingivalis*. This amoeba was present in 36 per cent of persons with generalized gingival pathology, but they could be

found in only 8 per cent of persons without generalized disease of the gingiva. One article appeared which was concerned with microbiologic investigation of intrabony pathology. Box²³² obtained cultures from several roentgenolucent areas in old extraction sites which could easily be said to be due to disuse atrophy. All cultures grew out highly motile cocci.

Reports on arch form and muscle forces

Sims²³³ described an apparatus, employing latex recording bulbs attached to a polyethylene tube and a converted electrocardiograph, for use in measuring the pressures exerted by the perioral and lingual musculatures. In 21 persons with excellent occlusion there was no correlation between labiolingual axial positions of the incisors and the pressure exerted by the perioral and lingual musculatures. It was also noted that, during swallowing, the tongue exerts 4 to 15 times the pressure of the labial musculature. Kozma²³⁴ urged the use of the gnathometer to facilitate the construction of cephalometrically correct models, thus enabling more accurate orthodontic diagnosis and treatment planning to be made.

Pulp Testing

Pulp testing received comments or investigations from several investigators. Dinin²³⁵ discussed the physics of the electric pulp tester. He also described an electric pulp tester utilizing an ammeter to ascertain whether or not the current is passing through the tooth. Cartledge and Rowbotham²³⁶ pointed out that the limitations of electric pulp testers should be kept in mind. The pulp tester, they claimed, should be recognized only as an adjunct in the diagnosis of pulpal conditions. It is the opinion of Cartledge et al.²³⁷ that the electric pulp tester is

the method of choice for determining pulpal vitality. Pulp degeneration, they noted, yields a raised threshold, whereas hyperemia and early acute pulpitis are accompanied by a lowered pain threshold. The electrical properties of human teeth were investigated by Farrell.²³⁸ It was observed that threshold increases with increased frequency of the current.

Allergy and other stress reactions

Strean²³⁹ noted that one of the most important situations which may confront a dentist is the patient with a hypoactive adrenal cortex due to withdrawal treatment or long continued stress. He emphasizes the importance of recognizing this condition in patients who are to undergo oral surgery, general anesthesia or both. The nature and mechanism of the nonspecific stress reaction was explained by Rohert.²⁴⁰ He observed that diseases of adaptation are one of the few discoveries that has involved medicine as a whole. The position of this new concept among some of the theories which have been proposed to explain the nature and origin of disease were pointed out. Kreshover²⁴¹ noted that it is important to distinguish between a true allergy and a toxicity reaction. An allergy, he stated, is an antigen-antibody interaction, whereas a toxicity reaction is a direct tissue response to injury. He observed that in either instance the resulting oral lesion may be indistinguishable from those seen in endocrine, nutritional or other systemic abnormalities. Sim²⁴² reported a case of an allergic reaction to acrylic resin. The oral manifestations consisted of large eroded ulcerated areas with yellow borders, and there was, in addition, ankle edema.

Miscellaneous reports

Sims²⁴³ attempted to corroborate the

findings of Hall and Howitt that human sera of periodontally diseased persons would agglutinate suspensions of the organism, *Micrococcus gazogenes*. The author was unable to support the findings of the earlier investigators. Vital stains placed in food or water were used for the detection of early caries in rats by Stephan.²⁴⁴ The best dyes for this purpose were found to be anthraquinone dyes, such as alizarin red S and alizarin blue S. Studies of the appearance of teeth under ultraviolet light were conducted by Durkacz and Mglej.²⁴⁵ Of particular interest was the suggestion that ultraviolet light may have a possible clinical application in the detection of caries. Soyenkoff and Okun²⁴⁶ measured the thermal conductivity of dental tissues. The conducting capacity of enamel was found to be slightly greater than that of dentin. By means of an electro-focus-test, Staudel²⁴⁷ claimed the ability to distinguish between inflammatory processes with and without the remote effects of a focus of infection. There were three reports concerned with the detection of a hemorrhagic diathesis. Schafer et al.²⁴⁸ described the important data for the diagnosis of essential thrombocytopenia, symptomatic thrombocytopenia and hereditary thrombopathy. A case of pseudohemophilia was presented by Douglas.²⁴⁹ The only abnormality that could be detected laboratorially was a particularly fragile blood clot. Malkin and Stevens²⁵⁰ described a case of plasma thromboplastin antecedent deficiency. The laboratory findings and the postoperative course of this patient were reported.

Summary

An attempt has been made in this report to summarize the progress in oral diagnosis during 1958. Publications concerned with clinical diagnostic information, roentgenography, and la-

laboratory tools and data have been considered.

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