

WHY DENTAL CARIES WITH MODERN CIVILIZATIONS?

13. Field Studies Among the Polynesians and Melanesians of the South Sea Islands

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SAMOAN ISLANDS

The native population of the Samoan Islands is Polynesian. The control of the islands is divided between two governments. The eastern group is American and the western group, now British.⁴ Before the World War, they were under German control. The western group is now under a mandate to New Zealand. Through the kindness of the Governor and Naval Officers of American Samoa, transportation was provided on an auxiliary craft to go to the various islands of the American Samoan group. We were particularly indebted to Commander Stephenson, Director of Health, whose guests we were, for continued personal assistance in making favorable contacts in nearly all villages of the American group of islands. In no islands of the Pacific did we find so excellent an organization for health service. Dispensaries have been established within reach of nearly all the villages besides hospital service at Pago Pago, the port of Tutuila. The naval station is located here. This is the finest port in the Pacific Ocean. Notwithstanding the regular monthly contact through merchant ships to and from America and Australia with this port, many isolated groups were found living largely on the native foods. A dental survey had recently been made of this group by Lieutenant Commander Ferguson.⁶ This is one of the few groups of islands in which the population is not rapidly decreasing; indeed there is some increase. The Navy personnel includes one dentist, who at present is Lieutenant Commander Lowry. His time is almost all required for the personnel and families of the Navy at this station. He, accordingly, can only do a limited amount of emergency service, such as extractions, for the natives. About 90 per cent of the inhabitants of American Samoa are on the largest island, Tutuila, and owing to the development of roads a considerable portion of the people have some access to the main port, to which several of them come on ship days to sell their

wares and buy provisions to augment their native foods. The incidence of dental caries among those living in part on imported foods at the port as compared with those in remote districts living only on native foods was as follows: those almost exclusively on native foods had 0.3 per cent of the teeth attacked by dental caries and for those on trade foods 18.7 per cent of the teeth examined.

HAWAIIAN ISLANDS

Several dental surveys have been made in the Hawaiian Islands. These islands are unlike any of the other Pacific island groups previously discussed. Sugar and pineapple plantations cover vast areas and together constitute by far the most important industries of the islands. In many districts the population is almost entirely foreign or various blends, chiefly of Filipinos and Japanese with Hawaiians. There is a large American population and a considerable European population. These different racial groups have largely brought their own customs which are rapidly submerging the native customs. Since the native population is so greatly reduced in comparison with the foreign population and because intermarrying has been so general, it was difficult to find large groups of relatively pure blooded Hawaiians either living almost entirely on native foods or on modernized foods. Though the number of persons in these groups is accordingly not large, important data was obtained for comparing the relative incidence of dental caries and other degenerative processes. While the native foods on the various Pacific islands have many factors in common; for example, all use the underground oven of hot stones for cooking, the Hawaiian Islands present one unique difference in the method of preparation of their taro. They cook the root as do all the other tribes, but, having done so, they dry the taro, powder it and mix it with water, and allow it to ferment for several hours, usually twenty-four or more. This preparation called "poi" has become slightly tart by the process of fermentation and has the consistency of a heavy strap molasses or a heavy cream. It is

eaten by rolling upon one or two fingers and sucked down. Accordingly, it offers no resistance to the process of mastication. In the districts where the natives are living on native foods the incidence of dental caries was only 2 per cent of the teeth examined; whereas among those natives who are living in large part on the imported foods, chiefly white flour and sweetened goods, 37.3 per cent of the teeth have been attacked by tooth decay.

COMMENTS

The study of the incidence of dental caries in these various South Sea Island groups in its relation to diet was only one of several of the problems investigated. Since nutrition is the principal factor that has been found related to the rôle of immunity and susceptibility to dental caries in my previous field studies, the collection of foods for chemical analysis and the gathering of detailed data regarding the articles of diet have been an important part of the activities of this group of studies. The data relating to the chemical and activator content of the foods are so voluminous that they cannot be included here and will accordingly be reported elsewhere.

Particular attention was also given to and data were collected for relating the incidence of irregularities of the teeth and dental arches to the type of nutrition. Similarly, studies were made of the persons who had been hospitalized in the few places where hospitals existed, chiefly in order to obtain data regarding the classification of those who are suffering from tuberculosis. These were similar to the studies that I have previously made and reported among the Eskimos and Indians of Alaska and northern and central Canada, and the people in isolated districts of Switzerland and the Outer Hebrides.

The physical excellence of the South Sea Islanders who were living on the native foods can be judged somewhat by the accompanying illustrations. I was frequently told that the only cause of suicide in the South Sea Islands was the suffering from aching and abscessed teeth. No dental service was available on most of the

⁶Ferguson, R. A.: A Dental Survey of the Children of American Samoa. J.A.D.A. (March) 1934.



Fig. 1—A typical Polynesian woman living on native food.

Fig. 2—A typical Polynesian man.

Figs. 3, 4, and 5—Typical modernized Polynesians.

islands and there were only a few dentists in all the Pacific archipelagos. If one will picture a community of several thousand people with an average of 30 per cent of all the teeth attacked by dental caries and not a single dentist or dental instrument available for assistance of the entire group, a slight realization is had of the mass suffering that has to be endured. Commerce and trade for profit blaze the way in breaching down isolation barriers far in advance of the development of health agencies and emergency relief, unwittingly made necessary by the trade contact.

While dental caries was most active in the period of overloads, such as growth and gestation and lactation, even the splendidly formed teeth of the adult men were wrecked by dental caries when the native food was

displaced with modern foods. In all the groups living on native foods with a liberal intake of animal life of the sea the health of the gums was generally excellent. When, however, the seafoods were limited in the dietary, heavy deposits formed and often were associated with a marked destruction of the supporting tissues with gingival infection. This condition was particularly prevalent among all groups near the ports who were displacing part of their native foods with imported foods.

In American Samoa through the cooperation of the educational authorities and the Director of the Department of Health, Commander Stephenson, and under the direct supervision of Lieutenant Commander Lowry, the dental surgeon, a group of four young men of the native staff

was selected and given instructions for the removal of the deposits. Instruments have since been provided, partly through the kindness and generosity of some American dental manufacturers. This probably constitutes the only native dental service that has ever been available in any of the Pacific island groups. The intelligence and aptitude with which these men were able to learn the fundamental principles, and their skill in carrying out a highly commendable prophylactic operation, was indeed remarkable. I gave them pieces of soap and asked them to carve a reproduction of an extracted tooth which was given as a model and in which they were required to increase all diameters to a given amount. Their work would probably equal if not exceed in excellence that of the first effort of 90

per cent of American dental students. Many of these natives are dexterous with their fingers and are skilled artists in carving wood and other material.

A service could be rendered to these people, who are in the process of modernization but who have no opportunity for dental assistance, by teaching some of the bright young men some of the procedures for rendering first aid. They could be

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compensated by contributions of native food and native wares, as our itinerant dentists were in earlier days. The people would not have money to pay an American or European dentist for his service until trade is carried on with currency.

Many of the Island groups recognize that their races are doomed since they are becoming exterminated through degenerative diseases, chiefly tuberculosis. Their one overwhelming

desire is that their race shall not die out. They know that something serious has happened since they have been touched by civilization. Surely our civilization is on trial both at home and abroad.⁷

⁷The discussion of foods in their relation to the susceptibility to dental caries, the development of facial deformity, the irregularity of the dental arches, and the influence of nutritional deficiency during the growth period on susceptibility to disease, particularly tuberculosis will be discussed in communications that will appear in the *Dental Cosmos* and the *Journal of the Canadian Dental Association*.