

The significance of this statement is illustrated by the report of Shambaugh concerning the frequent occurrence of lip cancer among fishermen exposed to tar. These men are prone to develop this malignancy, as tar is used extensively in the fishing industry to impregnate nets. The men having the most intimate contact with tar are those employed in the "net lofts," where nets are repaired and tarred. While mending the nets these men have the habit of holding the tar-smeared wooden needle between the lips on the right side of the mouth. Thus a frequent and close contact of the lips with the carcinogenic agent is established. As their hands and fingers are smeared also with tar, there exist additional opportunities of an exposure of the lips to tar, when these men eat their meals or handle their pipes. While these fishermen are out at sea, the tar smudge may stay on the lips for weeks. Lip cancer among net repairmen is not rare, but it has not received the proper attention, as the lip cancer in fishermen has been attributed usually to other causes.

In a series of 79 cases of lip cancer, observed between 1932 and 1933 in the Huntington Memorial Hospital at Boston, five cases were contributed by fishermen (Shambaugh), two of whom used to place the wooden needle between their lips. The same investigator collected from other sources an additional three cases of lip cancer in fishermen (total of 8 cases; 4 held needles between lips; 3 repaired nets; 1 used tarred nets) and had seen two cases previously. The lower lip was affected in all cases. The cancers were of the epidermoid type. The age range of this group was from 41 to 73 years (3 cases were 40 to 49 years old; 2 cases were 50-59 years of age; 4 cases were from 60 to 69 years old; and 5 cases were in their eighth decade). The time of exposure to tar varied from 5 to 60 years (5, 6, 10, 30, 40, 56, and 60 years, respectively).

The tar etiology of these lip cancers was supported by the fact that the loft workers, who remained indoors and were not exposed unduly to sunlight, suffered not infrequently from tar cancer of the face (cheek), which was occasionally multiple. The possible causal significance of pipe-smoking in the production of these cancers could be disregarded, as two of ten cases observed by Shambaugh did not use tobacco at all, and six of the remaining 8 men held their pipes on the side of the mouth opposite the cancer. Similar observations regarding the occurrence of tar cancer of the lip in fishermen were reported recently by Beck, who noted the excessive incidence of this type of malignancy among the fishermen in Campbeltown, Scotland. In mending their nets these fishermen put the bone or wooden needle, threaded with tarred twine, between their lips and established frequent and prolonged contact with this carcinogenic agent. When the tar-cresote mixture used by the fishermen was tested for the presence of carcinogenic properties by applying it to the skin of mice, papillomas were obtained within 106 days, and carcinomas of the cornifying squamous-cell type appeared later. The causal relationship between the par-