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ABSTRACT	This investigation quantifies the spatial distribution and inhomogeneity of tissue constituents of the human submandibular salivary gland in three states: normal, calculus sialadenitis and pleomorphic adenoma. With the aid of a light microscope and an ocular graticule for point counting, the basic stereological parameter of volume density was computed for 8 histological components. The volume density represents the distribution and the biologic variation its inhomogeneity. Within the 20-30 year age group, the normal submandibular gland does not show a difference in distribution of serous or mucous acini between the topological exterior and interior. If we assume a one-to-one relationship between acini and intercalated ducts, then the intercalated ducts are also equally distributed between the (topological) exterior and the interior. Thus, from the perspective of development of the gland, it may be deduced that primitive terminal ducts have an equal potential to form acini in the exterior or interior of the gland. The volume density of serous acini is as much as 11 times more than that of mucous acini, which confirms the wide disparity in the prevalence of, serous acini compared to mucous acini reported in qualitative studies. In calculus sialadenitis, the volume densities of serous acini and mucous acini diminished by 58 percent and 85 percent, respectively. The volume densities vf fibrous tissue and chronic infiamatory cells rose from 14.33 percent to 48.54 percent, 0.3 percent to 9.30 percent, respectively. The relative loss is higher for mucous acini than for serous acini; evidencing that mucous acini are more susceptible to inflammatory changes than serous acini. It is interesting to note that the biological variation of mucous acini does not undergo a change in sialadenitis, i.e., the disease process has equally affected mucous acini throughout the gland. To compensate for the loss of secretory function ducts proliferate. This study has identified intralobular ducts as the component contributing to this increase. The biologic variation of intralobular ducts has increased; for, one would expect the proliferation of intralobular ducts to be concentrated among those leading to unobstructed extralobuar ducts. Fibrous tissue, which replaces lost parenchyml elements,has seen an almost 3 fold increase in its volume density. The increase in its biologic variation reflects the inhomogeneous distribution of intralobular ducts. Age was not a factor in sampling, however, age dependent changes were corrected for serous acini; I the corrected data corroborated its remarkable decrease. The volume densities of epithelium and stroma in pleomorphic adenoma were computed, and was used to apply Seifert's

classification. The 9 pleomorphic adenomas examined belonged to either type 1 or type 2. Quantifying epithelium and stroma clearly provide a more rigorous basis to interpret and apply Seifert's criteria to classify pleomorphic adenoma. In order to provide for the maximum use of the pathologist's time and effort, the optimal number of Items at the sampling levels of sections and fields were computed. When 10 blocks from each tumour are selected: per block the optimal number of sections turns out to be 7 and the number of fields 2.