

$$2i = \frac{\log C}{\log r}$$

$$i = \frac{\log C}{2 \log r}$$

The percentage of full divergent drift between two languages is relatively large in the first period and gets progressively smaller. This means that the possibility of error is negligible in dealing with shallow time depths and becomes magnified as the depth increases. This can be shown by noting the standard error in the neighborhood of full time units when based on a list of the magnitude we have used, that is 165 items.

Percent of common vocabulary.....	72	52	37	27	19	14	10
Indicated time depth periods.....	1.0	2.0	3.0	4.0	5.0	5.0	7.0
Standard error in periods.....	0.2	0.3	0.3	0.4	0.4	0.6	0.6

The standard error is reckoned as the square root of the number of positive or negative cases, whichever is smaller. For example, if two languages have common forms in 36 cases out of 165, the percent in common is 22%, which corresponds to a time depth of 4.6 units. The standard error is the square root of 36, that is 6 or 3.6% of 165. An error of this magnitude amounts to about four tenths of a period.

The possibility of error is multiplied somewhat by inadequacies of the data and insufficiencies in our present knowledge of Salishan phonology. These factors should lead to a measure of caution in the interpretation of the time-depth values, particularly in dealing with time depths greater than five.

2.2. The vocabulary items used in our study total 165. Our working value for r (85%) was obtained in a study of English involving 225 items. The two lists were largely identical. Items in both lists were: I, thou, he, we, ye, one, two, three, four, five, six, seven, eight, nine, ten, hundred, all, animal, ashes, back, bad, bark, belly, big, black, blood, bone, brother (elder), child (son or daughter), cloud, cold, come, cry (weep), dance, day, dog, dust, ear, earth, eat,

egg, eye, far, father, fire, flower, fog, foot, good, grass, green, hair, hand, head, heart, here, hit (with fist), hunt, husband, ice, lake, laugh, leaf, left hand, leg, liver, long, louse, man, meat, mother, mountain, mouth, name, near, neck, night, nose, person, rain, red, right hand, road (trail), root, rope, salt, sand, short, sing, sister (elder), skin, sky, small, smoke, snake, snow, speak, spear (war), star, stone, sun, swim, tail, that, there, this, tongue, tooth, tree, warm, water, what, where, white, who, wife, wind, woman, year, yellow.

Words included in the Salish count but not in the English were: arm, arrow, aunt

(paternal), awl, ax, bow, brain, breast, canoe (bark), canoe (dugout), chisel, creek, fire-drill, firewood, fishhook, gall, go, grandfather (paternal), grandmother (paternal), hammer, hat, high, horn or antler, house, kidney, knife, leather, lip (lower), low, lung, moccasins, moon, morning, mouse, muscle, paddle, quiver, rib, robe, spoon, stomach, tobacco, uncle (paternal), vein, wolf.

Words in the English count not in the Salish were: they, twenty, and, at, because, berry, bird, bite, blow (wind), breathe, burn, clothing, cook, count, cut, die, dig, dirty, drink, dry, dull, fall, fat, fear, feather, few, fight, fish, float, flow, fly, freeze, give, guts, hear, hold, how, if, in, kill, know, lie, live, many, narrow, new, not, old, other, play, puke, pull, push, right (correct), river, rotten, rub, scratch, sea, see, seed, sew, sharp, shoot, sit, sleep, smell, smooth, some, spit, split, squeeze, stab, stand, stick, straight, suck, swell, thick, thin, think, throw, tie, turn, walk, wash, wet, when, wide, wing, wipe, with, woods, work, worm.

One would judge that the list used for English may on the average represent a slightly more stable set of items. This should be taken into account in forming any esti-

mate about the probable value of the unit of time depth.

3. Boas³ divides the Salish stock into two divisions and lists twenty 'dialects', giving subdivisions in some instances and pairing two dialects in one case (Lower Chehalis: Upper Chehalis). His classification is as follows:

Interior dialects: Shuswap; Lillooet; Thompson; Okanagon (Okanagon, Lake, Colville, Sans Poil); Columbian (Columbia, Wenatchi, Peskwaus); Spokane; Coeur d'Alène; Kalispel; Flathead (Pend d'Oreilles, Sematuse, Flathead, Plains Salish).

Coast dialects: Bella Coola; Comox (Comox, Pentlatch, Seshelt); Squamish; Lower Fraser (Lower Fraser, Nanaimo, Cowichan); Lkungen (Lkungen, Lummi, Clallam); Nootsack; Nisqualli (Skagit, Snohomish, Nisqualli); Twana; Lower Chehalis (Quinault, Xumtolep, Lower Chehalis): Upper Chehalis (Satsop, Upper Chehalis, Cowlitz); Tillamook (Tillamook, Nehelim, Siletz).

It is evident that the list of main dialects was intended to be complete, though the enumeration of subdialects is not exhaustive. Full information on subdialects is not available. One can get some idea of the full ramification of the subdivisions by comparing Boas' three subdivisions of Nisqualli (Nisqualli, Snohomish, Skagit) with Marian W. Smith's listing⁴ of 'tribal divisions' in the Coast Salish of Puget Sound:

Puyallup - Nisqually: Sahehwamish; Squakson; Puyallup; Nisqually.

Central Puget Sound: Duwamish; Suquamish; Snohomish.

Northern Puget Sound: Swinomish.

Inland Puget Sound: Muckleshoot; Snoqualmie; Skagit.

Each of these divisions embraces from one to twelve villages, including 'extended

villages'. Linguistic samples in the Boas Collection of manuscripts in the American Philosophical Society Library⁵ suggest that Marian Smith's 'tribal divisions' each had its own minor variations in language. Swinomish, which she sets apart from the other divisions on ethnographic grounds, is linguistically close to Skagit. Thus, it is evident that Boas' three subdialects were chosen as representative of the main subdivisions of the 'dialect'. It may be further inferred—though he does not say so explicitly—that Boas attempted to give a full and rounded picture of the stock. The many Salish dialects one finds mentioned in the literature, when not specifically included in Boas' classification, probably represent minor variations from one of his listed dialects or subdialects.

4. The statistical evaluation of linguistic distances provides an objective basis for the classification of the Salish languages. By this criterion we find Boas' classification confirmed in its general grouping but there are some wide variations in the scale of similarity he subsumed under different headings. This is most striking in the contrast of treatment between Spokane-Kalispel-Flathead, which Boas listed separately, and Comox-Seshelt-Pentlatch, which Boas listed as subdivisions of one dialect. Our figures show the following linguistic distances (Pend d'Oreilles is taken as representative of Flathead):

	Sp	Ka	Cx	St
Ka	0.5	—	St	1.8
Pe	0.5	0.2	Pt	2.4
				2.0

A linguistic distance as small as two tenths of a unit hardly justifies separate classification, and five tenths of a unit is not very considerable. If such dialects are separated, there can be no reason to lump together dialects as far apart as two full units more or less.

To rationalize the classification of the Sa-

³ Franz Boas and Herman H. Haeblerlin, *Sound Shifts in Salishan Languages*, IJAL 4.117-36, especially 4.120.

⁴ *The Coast Salish of Puget Sound*, AA 43.197-211.

⁵ Especially Marian W. Smith, *Vocabularies in Nootsack and other Coast Salishan languages*, ms. S 8 in the Boas Collection.