Chapter 9

Excavations At DgRw 199-F9

Feature 9 was first discovered by Ian Wilson during his 1987 survey of the False Narrows bluffs. After describing the contents of the large burial cave [Feature 1] at DgRw 199, he noted that human remains were also visible "in a low crevice to the east (sic) of the cave" [Feature 9] (Wilson 1987: 12). Later that year, a small-scale burial salvage project, directed by Mark Skinner, collected all human remains visible on the surface of 199-F9, which Skinner referred to as "the crevice" (Skinner 1991: 51). Skinner and his crew also removed two large boulders that partially blocked the entrance, and exposed a layer of highly fragmented, burnt human bone beneath the surface leaf litter which they decided to leave undisturbed.

When 199-F9 was reexamined during the current project, a recently excavated shallow pit was observed against the south wall of the chamber, and several human long bones, presumably removed from the pit, were found piled to one side of the hole. This disturbance was clearly the result of vandalism, and must have occurred sometime in the two years that elapsed between Skinner's project and ours. The threat of ongoing vandalism was one of the factors leading to the selection of this feature for excavation during the current project. The presence of an earlier skeletal collection from the feature was also an important consideration, given the Nanaimo First Nation's expressed wish that all the human remains interred together be kept together.

Excavation at 199-F9 was initiated in the fall of 1989, but was not completed until the end of the second field season, in summer 1992.

Feature Description

Feature 9 is located in a lightly wooded area near the base of the lower bluffs, in one of the densest concentrations of burial features discovered in the course of the project. Immediately to the southeast is F8; to the northeast are F23 and F1; due north is F10; and to the northwest are F11 and F22 (Figure 9.1). Feature 9 is formed from a massive sandstone slab that lies with its western edge resting on the ground, and its northeast and southeast corners propped up by smaller sandstone and conglomerate blocks, creating a wedge-shaped chamber beneath (Figure 9.2). The entrance faces southeast, and is a maximum of 2.46 m wide and 0.90 m high, giving easy access to the chamber inside. Although the entrance is relatively high, the roof slopes sharply downward to the northwest until it reaches ground surface, where it forms the back wall of the burial chamber. The floor also dips downward for a distance of about 60 cm west of the entrance , then runs more-or-less horizontally to the back of the chamber (Figure 9.4). Maximum dimensions of the chamber floor are 2.5 m northwest-southeast by 2.0 m northeast-southwest. Near the centre of the chamber, and occupying much of the floor space, is a large sandstone boulder which partially supports the ceiling slab, and effectively divides the chamber into eastern and western sections (Figure 9.3).

When reexamined during the 1989 site reconnaissance, the only human remains visible on the surface of the chamber were those piled to the side of the pothunter's pit described above: two femurs, three tibias, several ribs, a patella, and some cranial fragments, along with a deer humerus. Additional surface remains were later discovered in the western section of the chamber, but were initially obscured by the low ceiling and large cental boulder. These included a mandible, tibia, humerus, radius, several ribs and vertebrae, and numerous long bone fragments.

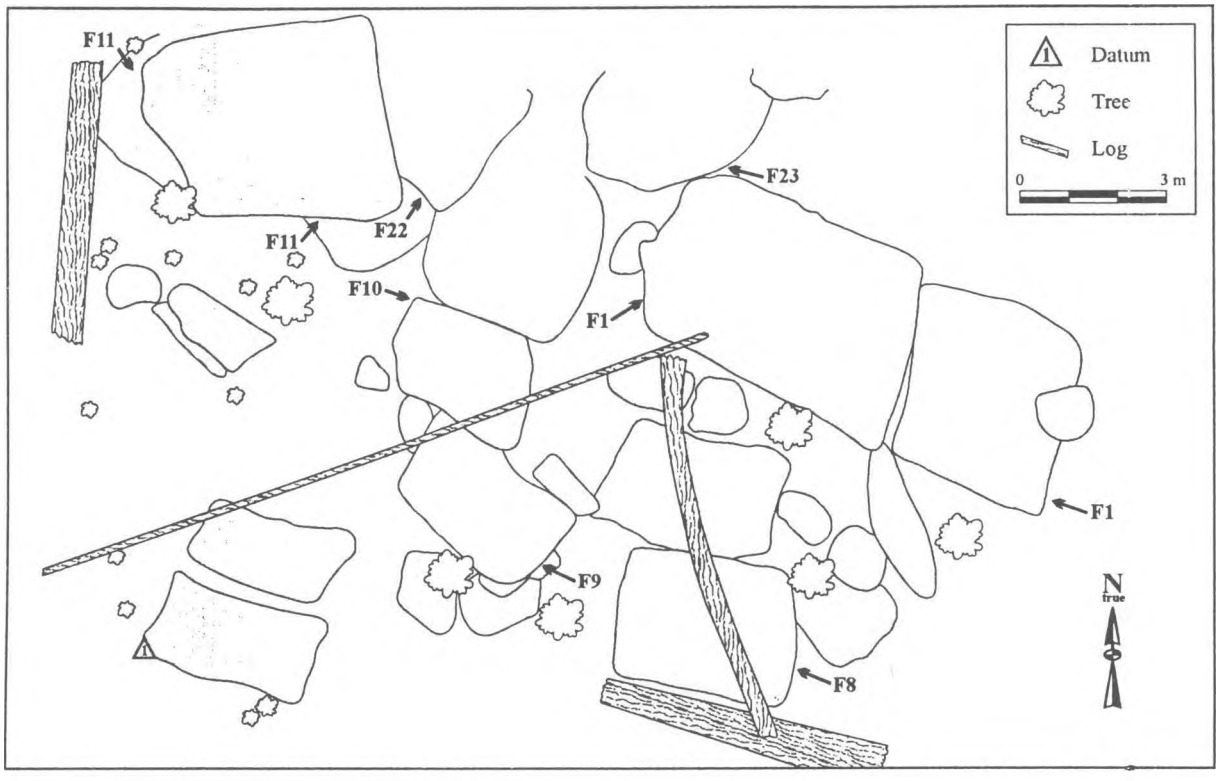

Figure 9.1 DgRw 199-F9 location.

Excavation Results

A grid of eight 1.0 x 1.0 m excavation units was laid out on the floor of the burial chamber (Figure 9.3), but the walls of the feature and the boulders supporting the ceiling slab placed restrictions on the extent of excavation possible, so that not all quadrants could be excavated. In EU 3 only the NE and SE quads were dug; in EU 5 only the NW and NE quads; in EU 7 only the SW and SE quads, and in EU 8, only the SE quad. Two-litre matrix samples were collected from each arbitrary level and natural stratum in EU 6 for later sediment and faunal analysis.

In the first of the two field seasons at 199-F9, the entire feature was surface-collected, EU 1 was excavated to what were thought to be culturally sterile deposits at 20 cm below surface, and EU 2 was partially excavated to a depth of 5-10 cm BS. On recommencing excavations in 1992, it was discovered that additional human remains were present in EU 1 below some sandstone slabs apparently fallen from the roof. All units were therefore excavated to 35-40 cm below surface, until no further human remains were encountered.

Matrix Description

The floor of the feature was covered by leaf litter and sandstone rubble, with occasional small shoots of oregon grape (*Berberis nervosa*) growing near the entrance. Three stratigraphic layers were tentatively identified during the excavation, although the abundance of intrusive roots and the filtering of sediments down through crevices between the many large boulders resulted in some matrix mixing, and tended to obscure stratigraphic details. A stratigraphic profile of the west walls of EUs 3, 4, and 8 is presented in Figure 9.5.

Layer A: moist, moderately compact, carbon-stained, medium to fine-grained sandy silt, ranging in colour from very dark brown (10YR 2/2) to dark greyish brown (10YR 3/2). The matrix is very organic, with a dense root mat throughout, as well as occasional larger roots extending from the arbutus tree in the southeast corner of the feature. It contains abundant sandstone cobbles, slabs, and boulders, some of which are ceiling fall, while others may have been deliberately placed to close off the entrance. Snail shells are a frequent natural inclusion. Cultural content includes burnt, fragmented human bone, one ba-

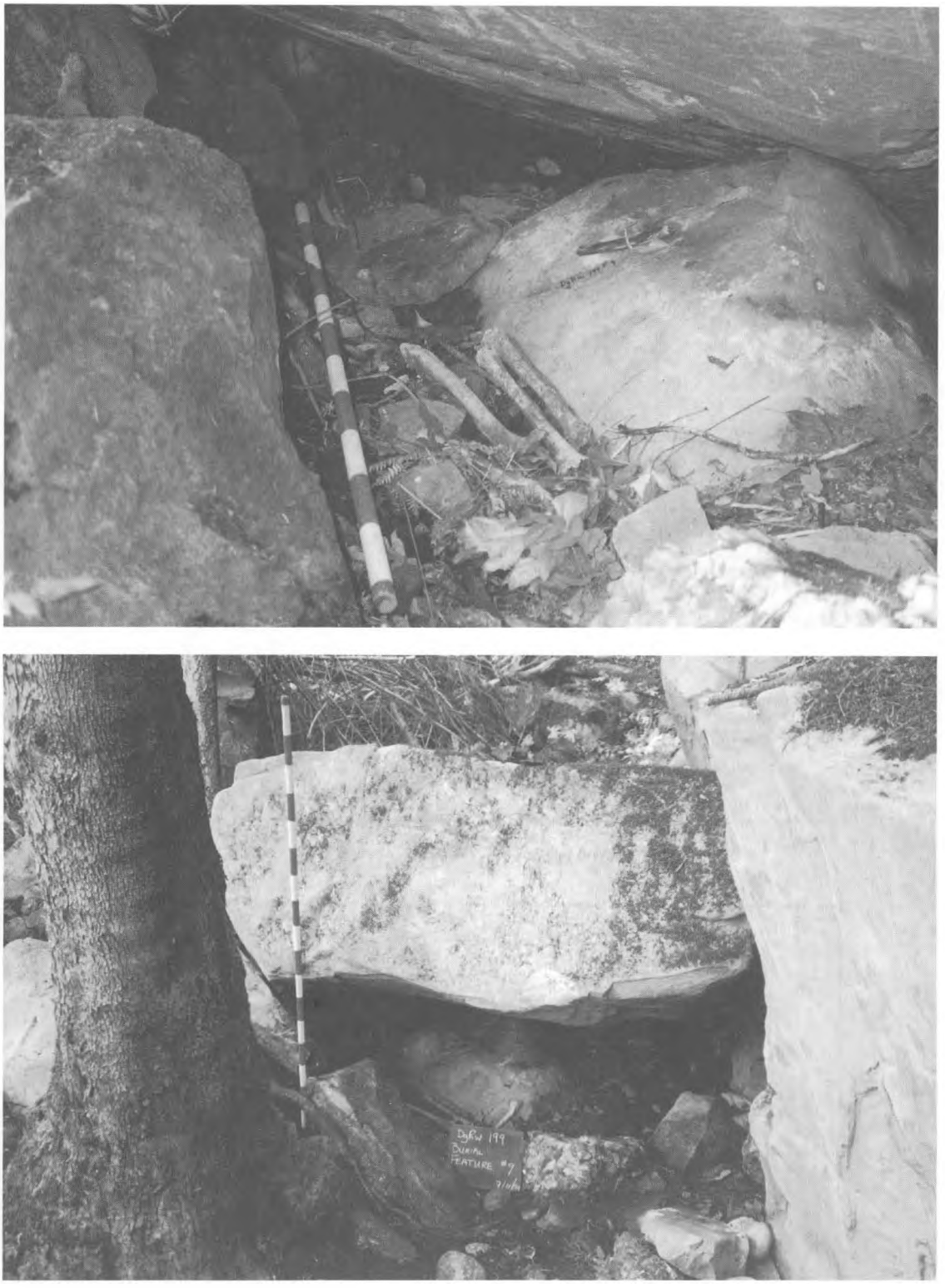

Figure 9.2 Entrance to DgRw 100-F9 (top); view inside burial chamber (bottom); scale bar 10 cm.

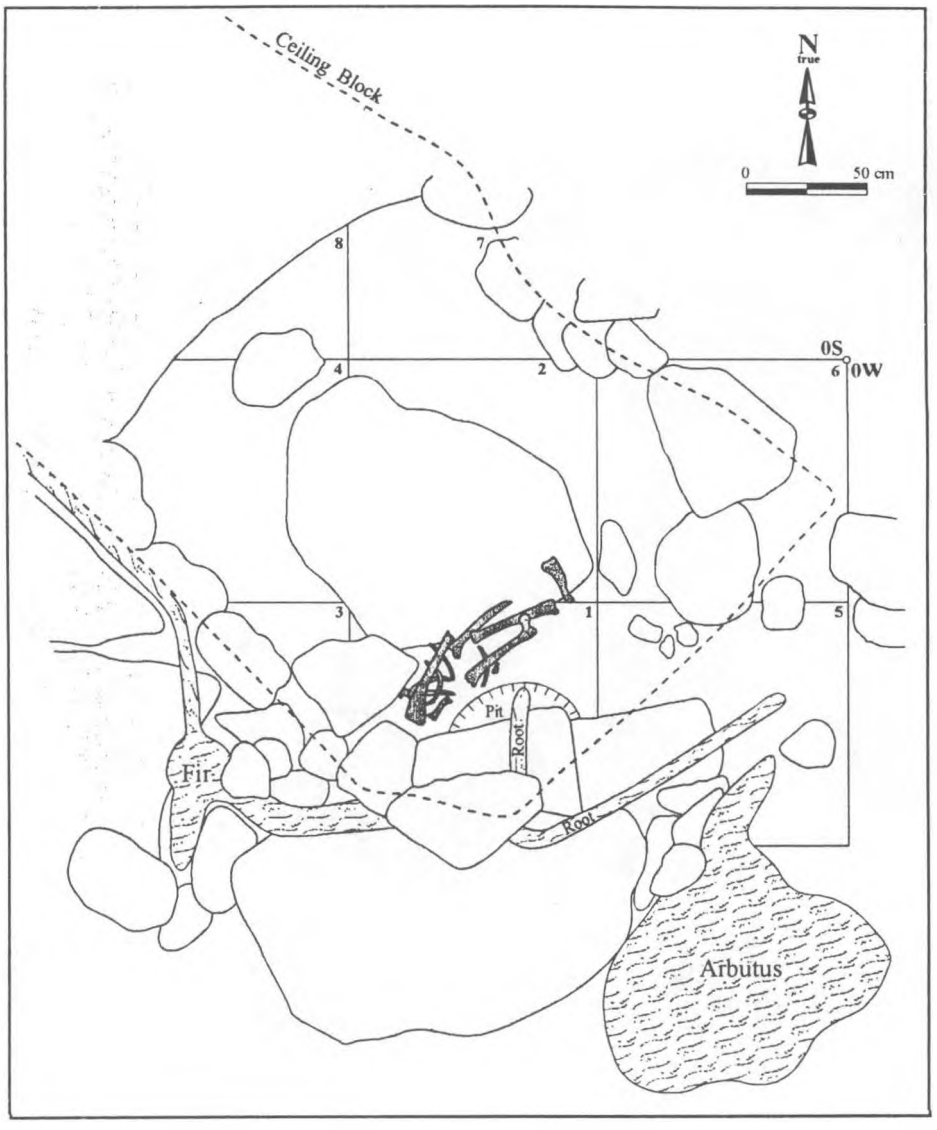

Figure 9.3 DgRw 199-F9: floor plan.

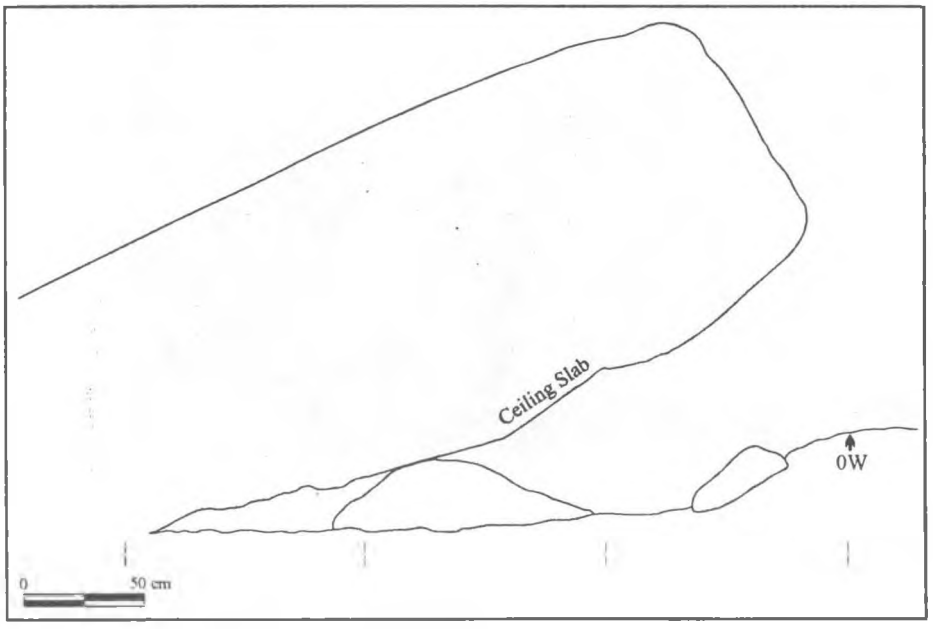

Figure 9.4 DgRw 199-F9: cross-section of burial chamber.

salt flake, some mammal bone, and minimal amounts of crushed clamshell. No fire-altered rocks were found, suggesting that the human bones were not burnt *in situ*, but removed to the feature after cremation. Layer A ranges in thickness from 5-25 cm, being thinnest along the perimeter of the feature and thickest around the central boulder.

Layer B: moist, moderately loose, medium-grained, dark brown (10YR 3/3) to dark yellowish brown (10YR 3/4) sandy silt. This layer is lighter in colour and contains more sand but less carbon than the overlying Layer A. Roots and rock inclusions, predominately sandstone slabs and conglomerate rubble, are still abundant, but human and faunal remains are appreciably less frequent. Five stone flakes were found in this layer; three additional artifacts (a flake, a core, and a ground slate point fragment) were recovered from the Layer B/C interface and could not be attributed with certainty to either layer. Layer B ranges in thickness from 15-25 cm, and like Layer A, is thickest in the central portion of the feature.

Layer C: loose, dry, medium to coarse-grained, dark yellowish brown (10YR 3/6) silty sand. This layer is lighter in colour than Layer B and contains more rocks, particularly pebbles. Roots continue to be abundant. No charcoal or shellfish remains were observed, and the only cultural material possibly attributable to this layer are a cluster of heavily weathered, unburnt human bones and three artifacts recovered from the Layer B/C interface of units 1 and 3. Four additional human fragments collected from Layer C in EUs 4 and 8 were clearly redeposited from Layer B. Layer C was exposed throughout the feature except EUs 5 and 6 at depths of 30-40 cm BS.

Faunal Remains

The faunal assemblage from 199-F9 is derived from three sources: Skinner's 1987 project, the excavated sample from the 1989 and 1992 field seasons, and 2-litre matrix samples collected from each level of EU 6. Apart from abundant land snail shells, which are a natural occurrence in this habitat, the only faunal remains collected by Skinner were a horse clam valve, a burnt bird tarsometatarsus, a deer scapula with cutmarks, and three elements from medium-sized mammals, two of which were burnt (Skinner 1991: 74, 95-96). The two seasons of excavation during the present study yielded 198 skeletal elements, and an additional 387 vertebrate specimens were recovered from the matrix samples. Table 9.1 summarizes the vertebrate faunal distribution by sample source, and complete faunal catalogues are presented in Appendix A, Tables A.14-A.16. The following discussion is based on the results of the faunal analyses of van Gaalen (1991, 1994) and Kusmer (1992).

Table 9.1 Summary of vertebrate fauna (NISP), DgRw 199-F9.

Source	Fish	%	Bird	%	Mammal	%	Misc	%	Total
Skinner	0	0.0	1	20.0	4	80.0	0	0.0	**5**
Excavation	52	26.3	52	26.3	94	47.5	0	0.0	**198**
Matrix Sample	111	28.7	13	3.4	260	67.2	3	0.8	**387**
Total	**163**	**27.6**	**66**	**11.2**	**358**	**60.7**	**3**	**0.5**	**590**

The vertebrate faunal collection from 199-F9 differs from that of 199-F1 in the preponderance of mammalian remains, which comprise nearly half of the excavated sample and two-thirds of the matrix sample; in this characteristic, 199-F9 most closely resembles 204-F2. More than half of the mammal bones from the excavated sample were identified to taxon. In terms of numbers of identified specimens (NISP), domestic rabbit (*Oryctolagus* sp.), deer (*Odocoileus* sp.), raccoon (*Procyon lotor*), and various members of the mice and rat family (Muridae) dominate the assemblage; about one-quarter are from immature individuals (rabbit, raccoon, deer, and unidentified mammal). The domestic rabbit remains are all consistent with a single individual and probably represent a family pet that fell prey to a carnivore. Mammal remains recovered from the matrix samples, although numerous, are generally small and very highly fragmented, so that fewer than 10% (mainly small rodents) could be identified to taxon.

Fish remains comprise approximately one-quarter of both the excavated and matrix samples from 199-F9. These proportions are similar to 204-F2, but the constituent species are very different: only salmon and herring were recovered from 204-F2, while 199-F9 yielded no salmon and very little herring, and (like 199-F1) is dominated by local, non-migratory fish (van Gaalen 1994:15).There is surprisingly little over-

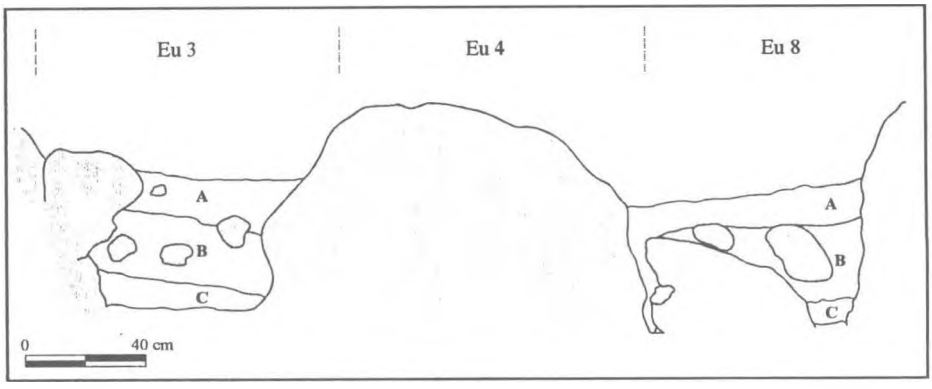

Figure 9.5 DgRw 199-F9: stratigraphic profile at 2.0 m west.

lap in identified fish species between the excavation and matrix samples (Table A.16), with rockfish (*Sebastes* sp.) most common in the former, and cabezon (*Scorpaenichthys marmoratus*) in the latter. However, since the majority of fish remains from both samples could not be identified to taxon, this difference may be more apparent than real. Skeletal elements from the vertebral column, pectoral girdle, opercular region, branchial arch, and mandibular arch were identified.

Avian remains were considerably more numerous in the excavated sample than the matrix sample, and in contrast to fish specimens, the majority could be identified to taxon. Waterfowl, including bay and surface-feeding ducks (Aythyini and Anatini tribes) are most abundant, followed by perching birds such as thrush (Turdinae) and crow (Corvidae), woodpecker (Picidae), and grouse (Tetraoninae). Wing and leg elements predominate in the skeletal collection, but pelvic bones were also found.

Modifications attributed to animal activity (rodent gnawing, carnivore chewing) were observed on 3.0% of the collected remains, all mammal. More frequent was the evidence for human modification (burning, cut marks, spiral fractures, etc.), which affected 13.6% of the excavated assemblage, and all three faunal classes to some extent. Burning was even more prevalent in the matrix sample fauna, with 64% of the fish, 67% of the reptile, 62% of the bird, and 91% of the mammal bones affected (van Gaalen 1994:18). The latter figure may be inflated, however, by the inclusion of small fragments of cremated human bone that were not identified as such during the analysis.

Spatially, the excavated fauna tend to be concentrated along the back wall of the burial feature, in EU 4 (47.5%), EU 8 (17.2%), and EU 3 (13.6%), and in the upper 10 cm of the deposits (56.6%). The vertical distribution of fauna from the matrix samples collected near the entrance to the feature (EU 6) is quite different, as shown in Table A.17, with the majority of specimens recovered from level 4 (15-20 cm BS).

Shellfish remains were conspicuously scarce during the excavations at 199-F9, although occasional occurrences of butter clam, littleneck clam, basket cockle, mussel, and crab were noted. The six matrix samples collected from EU 6 yielded a total of 6.6 grams of shell: 54.5% Oregon land snail (*Allogona townsendiana*), 43.9% clam, and 1.5% crab by weight (Table A.18). Not unexpectedly, snail shell predominates in the upper levels of the unit, with clam shell more common in levels 3 and 4 (Kusmer 1992).

As was the case with all of the other excavated burial features except 204-F6, the faunal assemblage at 199-F9 appears to have accrued through a combination of natural processes, including carnivore scavenging, and human intervention, particularly the provision of food remains for the dead.

Artifacts

Eight stone artifacts were recovered from 199-F9: one ground slate point fragment (Figure B.1f), one flaked core, and six pieces of flaking detritus. The artifacts are dispersed throughout the feature both horizontally and vertically, being found in five of the eight excavation units and six of the eight excavated levels. The flakes are generally large and crude. Four of the six retain remnants of cortex on striking platforms and dorsal surfaces, suggesting very early stages of lithic reduction (primary decortication), or perhaps the testing of raw materials for flaking suitability. The core is also partially cortex-covered; in this case the cortex is very smooth and highly polished

suggesting that the core originated as a water-rolled cobble. A variety of raw materials were employed, including a light green felsite, greywacke, basalt, and a reddish gritstone; all are coarse-grained with poor flaking qualities. Detailed descriptions of the artifacts may be found in Appendix B.

Dating

Analysis of bone collagen extracted from unburnt human rib and vertebra fragments yielded a radiocarbon age of 2670 ± 60 years BP, or a C^{13}-adjusted age of 2830 ± 60 years BP (Beta-37845). The former date is virtually identical to the unadjusted radiocarbon age of 2680 ± 70 years obtained by Skinner (1991: 47) on a femur fragment he collected from the surface of this feature in 1987. The C^{13}-adjusted date places the burial feature within the late Locarno Beach Culture Type of the Gulf of Georgia chronology.

Human Remains

A total of 9,906 human skeletal fragments were recovered during the 1989 and 1992 excavations at 199-F9, which, in addition to the 2,623 fragments collected during Skinner's 1987 project, yields a total human bone assemblage of 12,529 pieces. Of these, 6,258 fragments (49.9%) were too small to be identified to element. It should be noted that Skinner (1991: 58) originally reported collecting only 467 human bone fragments from the feature, but reexamination of this material revealed several discrepancies in the human remains catalogue, including instances where hundreds of hand and foot bones were bagged together under a single number, or a single element was assigned several numbers. Although some fragments could not be relocated, the revised total of 2,623 is the best estimate of the number of human remains actually collected in 1987. Most skeletal elements are well represented in the human bone assemblage from 199-F9. In particular the frequency of cranial remains serves to distinguish the two DgRw 199 burial features from those of DgRw 204 (Table C.1).

Condition

Nearly 70% of the assemblage was categorized as in "poor" condition, whereas less than 10% was deemed "good". Most of the bones are highly fragmented and even the more complete specimens tend to exhibit weathered or exfoliated cortical surfaces with broken or missing metaphyses. Root penetration into medullary cavities appears to be largely responsible for the poor preservation of cancellous bone, which, when present, tends to have a loose, sawdust-like texture, with most structural detail lost. Location within the burial cave clearly affected preservation. The two innermost units (EU 4 and EU 8) yielded the highest frequencies of well-preserved bone (31.5% and 25.4% respectively), whereas bones from nearest the entrance (EU 5 and EU 6) were the most poorly preserved (only 3.2% and 2.5% classified as "good" condition).

Approximately 2% (n=192) of the skeletal fragments were coated with an opaque, greyish-white calcareous plaque, apparently a precipitate from the walls and/or ceiling of the feature. Most often this presented as small discontinuous patches, but occasionally it formed a thick continuous sheet completely encasing the element and obscuring the cortical surface. Proximity to the walls was clearly a contributing factor in the development of the plaque, with bones from the innermost recesses of the feature being most frequently affected. None of the elements from EU 5 exhibited the plaque, but fully 30% of the remains collected from EU 8 were affected. Depth below surface is also a contributing factor: 89% of the mineral-coated fragments come from the top 10 cm of the deposits, and none was found below 20 cm BS.

Evidence of animal disturbance is uncommon. Of the total sample, including Skinner's surface collection, only 15 elements (0.12%) are affected. Rodent gnaw marks were observed on 11 elements: a humerus, three radii, a hamate, a middle hand phalanx, an innominate, a rib, a femur, and two unidentified long bone shaft fragments. Four additional specimens (a mandible, two ulnae, and a calcaneus) exhibit splintering and conical puncture marks attributed to carnivore chewing. Both rodents and carnivores appear to prefer unburnt bones for their meals: 12 of the 15 affected bones are unburnt, and the three burnt specimens exhibit only slight discolouration.

Possible cutmarks were observed on five specimens. Three distal humerus fragments (two unburnt, one charred black) exhibit series of three to five narrow, parallel, transverse to oblique cuts 2-7 mm in length on the anterior prominence of the shaft above the distal articular surface. This location is the typical cutting site for severing the flexor tendons of the elbow, and such marks may be viewed as unequivocal evidence for *post mortem* disarticulation (White 1992: 241). Another unburnt humerus fragment shows five short (< 3 mm), closely-spaced transverse cuts on the lateral wall of the bicipital groove above the deltoid tuberosity; additional narrow cuts interspersed with broader, deeper hack marks extend down the anterolateral border to the deltoid tuberosity. Cutting in these locations would sever the *deltoideus* and *pectoralis major* muscles, and may have served to disarticulate the arm at the shoulder. The fifth specimen is a slightly burnt rib shaft fragment which has two longer

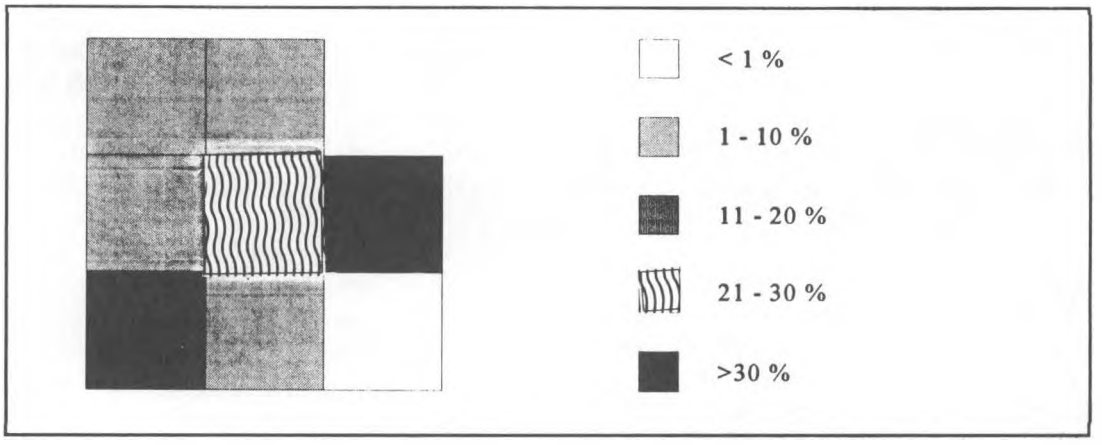

Figure 9.6 Horizontal distribution of human remains, DgRw 199-F9.

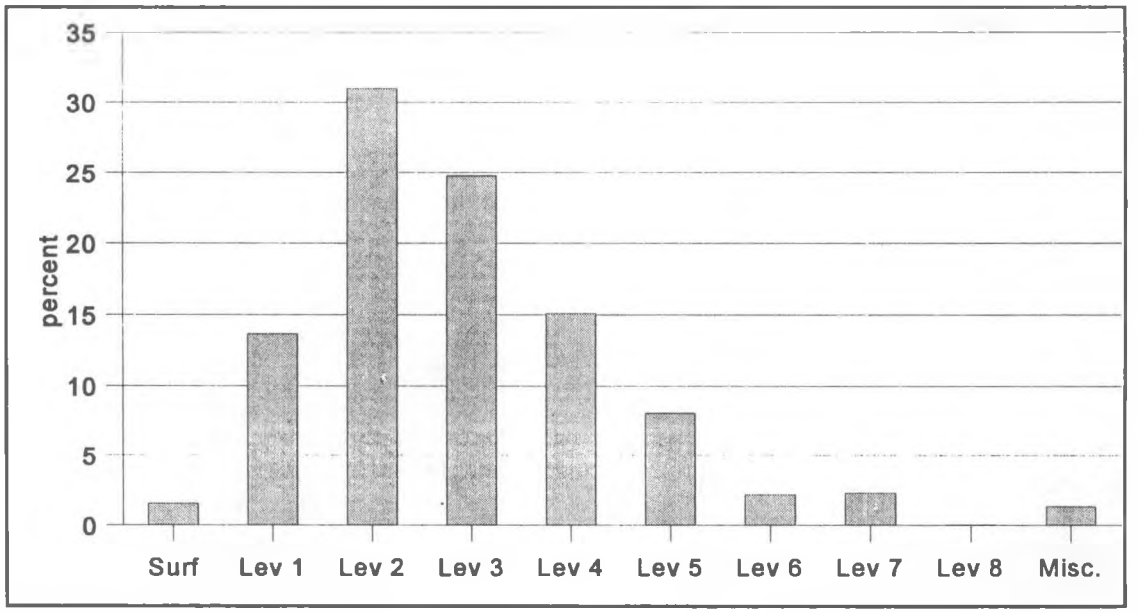

Figure 9.7 Vertical distribution of human remains, DgRw 199-F9.

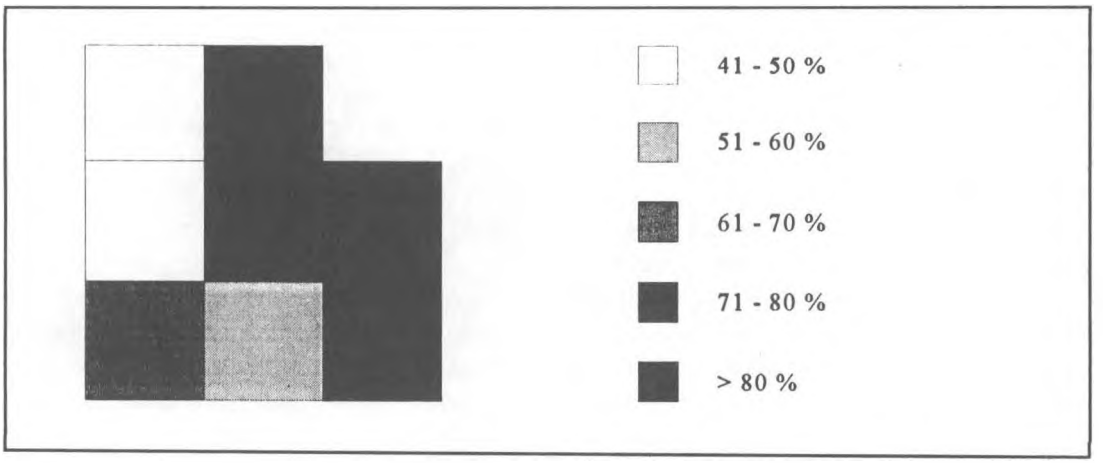

Figure 9.8 Horizontal distribution of burnt human bone (% of unit total).

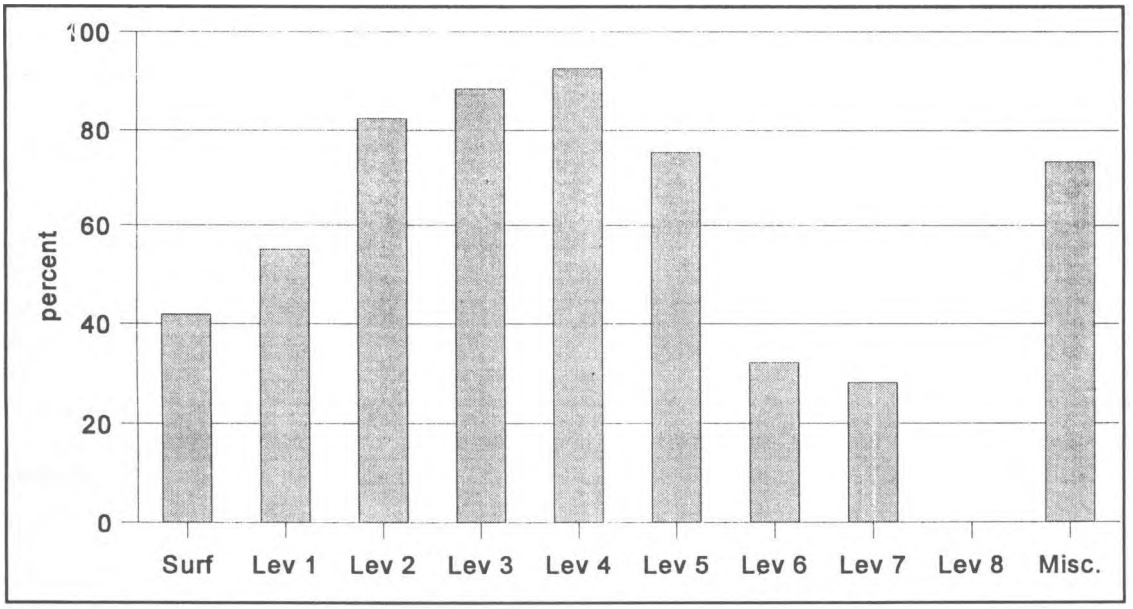

Figure 9.9 Vertical distribution of burnt human bone (% of level total).

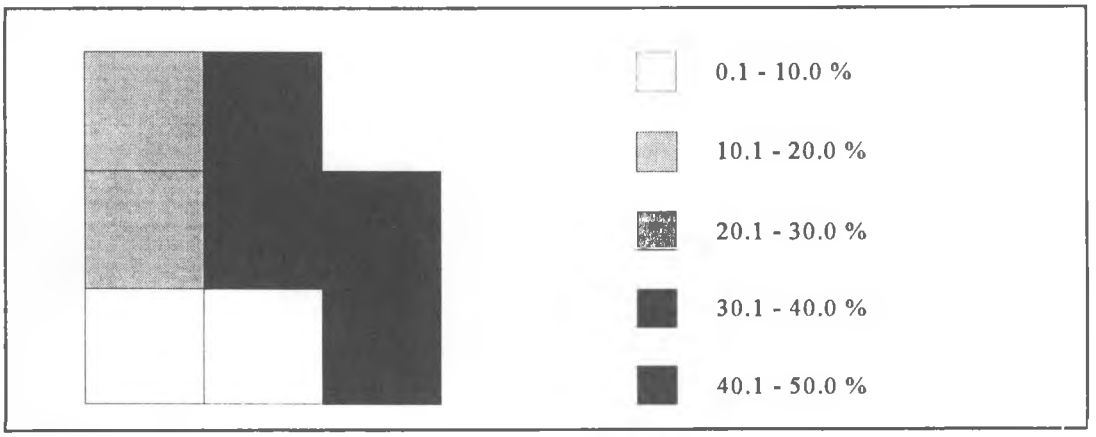

Figure 9.10 Horizontal distribution of calcined human bone (% of burnt).

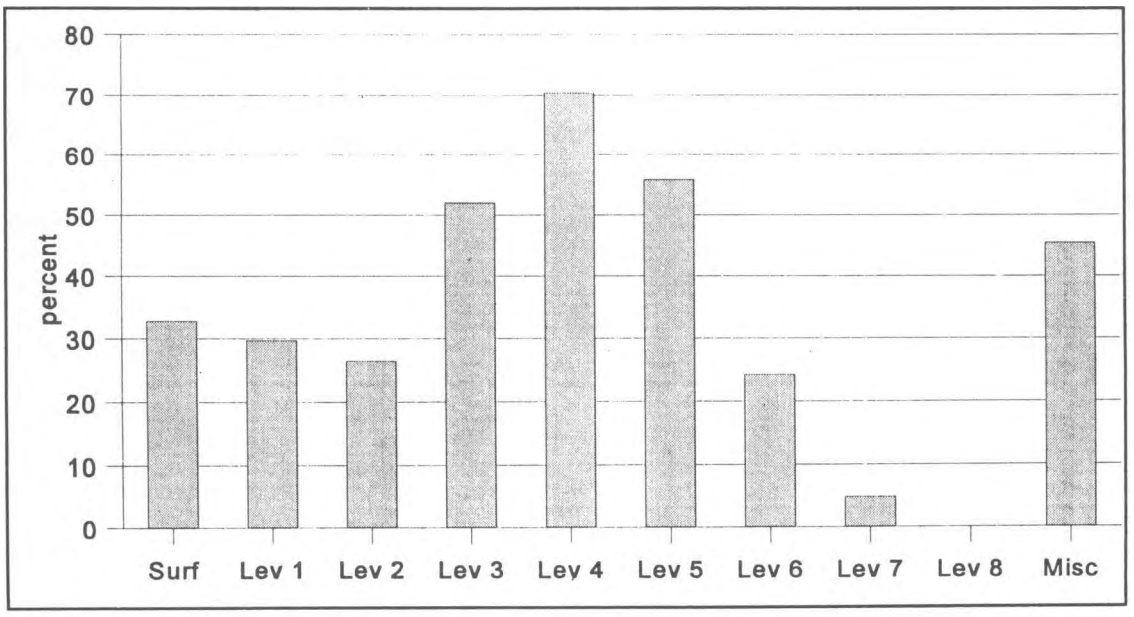

Figure 9.11 Vertical distribution of calcined human bone (% of burnt).

(9 mm, 14 mm), slightly curvilinear cuts on the visceral surface. Whether these are true cut marks or post-depositional artifacts is unclear. Certainly their location, orientation, and configuration are not typical of other documented tool marks on ribs, either human (White 1992) or faunal (Binford1981; Grayson 1988; Villa et al. 1986), which have been interpreted as evidence for defleshing.

Distribution

Horizontal and vertical provenience are known for 9,774 of the fragments recovered during the 1989 and 1992 excavations, or 78% of the total sample. An additional 132 pieces (1.05%) were recovered from re-screened backdirt, and are of unknown provenience. The provenience of the rest of the sample, collected by Skinner in 1987, is problematical. Presumably most of these were surface remains, since his stated mandate was to collect all human bone visible on the surface. However, his report (Skinner 1991: 51) also makes reference to some excavation at the feature ("...as it became obvious that bones were to be found deeper into the matrix...excavation ceased..."), although no details are provided as to the location, size, or depth of the excavation unit(s), and no evidence of the excavation was apparent when the feature was revisited in 1989. Further, although his system of cataloguing implies that some horizontal controls were imposed in the field, the collection method is not described, so reconstruction of horizontal provenience for this material was not possible. Therefore analysis of the spatial distribution of human remains in the feature (summarized in Table 9.2) is based solely on the excavated sample, except where noted.

As Figure 9.6 illustrates, the densest concentrations of human remains occur near the entrance to the burial chamber, in EU 6 (particularly the NW quadrant) and EU 2 (NE quadrant). The sparsest concentrations are found along the northwest (EUs 4, 7, and 8) and southeast (EUs 3 and 5) perimeters of the feature. Human remains were found to a maximum depth of 37 cm below surface, but the majority were recovered from the upper 20 cm of the deposits, most particularly levels 2 and 3 (Figure 9.7).

Table 9.2 Spatial distribution of human remains, DgRw 199-F9.

Unit	Surf.	Lev 1	Lev 2	Lev 3	Lev 4	Lev 5	Lev 6	Lev 7	Lev 8	Total	%
EU 1	17	263	212	130	26	28	26	14	0	716	7.3
EU 2	5	207	994	954	678	80	12	0	0	2,930	30.0
EU 3	53	217	664	404	72	180	145	212	0	1,947	19.9
EU 4	41	173	110	17	12	14	5	2	1	375	3.8
EU 5	2	15	12	29	3	1	0	0	0	62	0.6
EU 6	7	350	909	795	591	486	28	0	0	3,166	32.4
EU 7	3	37	137	105	104	7	0	0	0	393	4.0
EU 8	25	92	32	22	9	3	1	0	1	185	1.9
Total	153	1,354	3,070	2,456	1,495	799	217	228	2	9,774	100.0
%	1.6	13.9	31.4	25.1	15.3	8.2	2.2	2.3	0.0	100.0	

Burning

Evidence of burning is pervasive in the assemblage (see Table C.5 for a comparison of burning frequency in the five excavated burial features). Very small fragments were not scored for this variable, but of the 8,038 pieces for which this information was recorded, 77.5% (n=6,229) exhibit some degree of burning. Although burnt bone is present in all excavation units, it is much more prevalent in units 5, 6, 2, and 7 which are located at the entrance to the feature (Figure 9.8). It is unclear whether this pattern reflects prehistoric mortuary behaviour or more recent activities, such as Skinner's 1987 surface collection, which appears to have focussed on the more readily accessible entrance area. The apparent differences in ratios of burnt to unburnt bone may simply reflect the earlier removal of unburnt bones from the anterior areas of the cave.

The vertical distribution of the burnt remains is also not uniform: they are significantly less common in the top 5 cm and bottom 15 cm of the deposits. To a certain degree this pattern is governed by the distribution of human bone in general; that is, the amount of human bone recovered from the upper and lower levels is also low. However, when the frequency of burnt bone is expressed as a percentage of the level

totals (Figure 9.9), the same general pattern is apparent, although the magnitude of differences between the upper, middle, and lower deposits are less pronounced. With reference to the surface remains, the calculated percent of burnt bone is certainly inflated, since most of the unburnt surface bone was removed in 1987 when the feature was surface-collected, and is not included in this analysis.

Intensity of burning was scored for 4,709 bone fragments, or 75% of the burnt assemblage, following the methods described in Chapter 3. Of the subsample of burnt remains, 46% (n=2,167) were categorized as severely burnt. Spatially, the horizontal distribution of severely burnt (calcined) remains mirrors that of the burnt bone in general (Figure 9.10), except at the back (west) of the feature where calcined bone is slightly more common in EUs 4 and 8, and slightly less common in EUs 1 and 3. These calcined remains also show an interesting vertical distribution (Figure 9.11). In the upper and lower deposits, a smaller proportion of the burnt remains were calcined, but in the middle deposits (levels 3-5) more than 50% of the burnt remains were severely burnt.

The burned fragments show a preponderance of deep, curved, transverse cracks and fractures, sometimes ending in "hinge" terminations. Exfoliation of the outer table of cranial fragments and the external cortex of long bones sometimes occurs, and severely burnt pieces are frequently shrunken and warped. These features are characteristic of bodies burned while fleshed, or the cremation of green, defleshed bones (Baby 1954; Binford 1963; Buikstra and Swegle 1989). The patterns of burning on some of the reconstructed elements supports this interpretation. One nearly complete left femur has an unburned proximal end, moderately burned midshaft, and calcined distal metaphysis. Another femur exhibits an unburned proximal end and charred distal shaft. An otherwise unburnt tibia displays charring on the medial midshaft and anterior distal metaphysis. In all three cases, the intensity of burning is greatest where, in life, there is least muscle cover, suggesting that the bones were fleshed when burnt. A similar pattern is seen with the reconstructed skulls: the occipital and inferior parietals tend to be less severely burned than the superior parietals, frontal, and face, presumably because they were somewhat shielded by the nuchal and temporal musculature.

Curiously, the vertebrae do not conform to the expected pattern, which would predict that the more superficial regions (transverse processes and spinous processes) should be more severely burnt than deeper regions (the centra). Instead, the vertebrae tend to be consistently affected: either completely unburnt, or completely charred, or completely calcined. This may be a factor of the position of the body in relation to the oxidizing point of the fire in which it was burned.

It should be emphasized that the ratio of burnt to unburnt bone fragments does not necessarily reflect the ratio of cremated to uncremated bodies, since unburnt bones tend to be larger and more complete than the burnt bones, which, being very friable, are more likely to be fragmented into tiny pieces, thus inflating the relative frequency of burnt remains. When the *element* is the unit of analysis, unburnt bones represent approximately half of the identified specimens. Similar unburnt to burnt ratios were obtained for all of the major long bones studied: right clavicle 5:4; left humerus 5:7; left ulna 6:5; left radius 7:4; right femur 6:3; left patella 3:5; left tibia 7:7; right fibula 4:4. This suggests that although burnt pieces greatly outnumber unburnt ones, this is primarily a function of their higher fragmentation rates, and that the ratio of unburnt to cremated bodies may be roughly equal.

Of course, there are some problems with this interpretation as well, since minimum number of elements (e.g., left radii) was not calculated from whole bones but from fragments (e.g., the number of left radial distal articular surfaces), and it does not necessarily follow that because the distal articular surface was unburnt, the (unrecovered) rest of the bone was also unburnt. In fact, if the bodies were indeed burnt while fleshed, one would expect the bones to display differential burning with some portions apparently unburnt and others burnt to a greater or lesser degree.

Skeletal Reconstruction

Reconstruction of fragmented skeletal elements is a very labour intensive activity, particularly when the assemblage consists of a large number of very small fragments. Time constraints established limits to the amount of reconstruction that could be attempted, and it is certain that more could have been accomplished given unlimited time and labour. Despite these restrictions, a total of 1,227 fragments (9.8% of the assemblage) were found to conjoin with other fragments, yielding 332 conjoined "sets" of between 2 and 77 pieces. In terms of numbers of conjoined pieces, greatest success was achieved in reconstructing the skull, probably due to its distinctive shape and the number of easily identifiable anatomical landmarks. Vertebrae produced the largest number of conjoined sets, probably for similar reasons, followed closely by the skull. An element-by-element breakdown of the reconstruction is presented in Table 9.3.

Table 9.3 Summary of reconstructed skeletal elements, DgRw 199-F9.

Element	Sets	% Sets	Pieces	% Pieces
Skull	44	13.25	346	28.20
Mandible	15	4.52	58	4.73
Vertebra	46	13.86	122	9.94
Rib	19	5.72	40	3.26
Sternum	1	0.30	3	0.24
Clavicle	1	0.30	2	0.16
Scapula	7	2.11	16	1.30
Humerus	14	4.22	62	5.05
Radius	2	0.60	7	0.57
Ulna	10	3.01	31	2.53
Carpal	2	0.60	4	0.33
Metacarpal	5	1.51	10	0.82
Hand phalanx	9	2.71	19	1.55
Sacrum	5	1.51	12	0.98
Innominate	16	4.82	40	3.26
Femur	26	7.83	149	12.14
Patella	2	0.60	5	0.41
Tibia	19	5.72	72	5.87
Fibula	21	6.33	74	6.03
Tarsal	7	2.11	18	1.47
Metatarsal	4	1.20	10	0.82
Foot phalanx	1	0.30	2	0.16
Radius/ ulna/fibula	16	4.82	39	3.18
Humerus/ tibia/femur	36	10.84	78	6.36
Long bone	4	1.20	8	0.65
Total	**332**	**100.00**	**1,227**	**100.00**

The number of fragments incorporated into the conjoined sets is extremely variable. The majority of the reconstructed sets are comprised of only two articulating pieces (n=199; 59.9%), but three-piece (n=61), four-piece (n=25), and five-piece (n=14) sets are not uncommon. Sets comprised of more pieces are correspondingly rarer, but include six-piece (n=6), seven-piece (n=5), eight-piece (n=4), nine-piece (n=2), ten-piece (n=2), and thirteen-piece sets (n=3). The remaining 11 sets are comprised of 12, 15, 17, 18, 19, 20, 22, 26, 27, 43, and 77 pieces respectively. All of the very large sets are reconstructed cranial elements, but some long bone sets also contained relatively large numbers of fragments.

Comparisons of degree of dispersal of the component members of the reconstructed sets was made for all sets whose provenience was known. A total of 74 sets containing elements from Skinner's surface collection were eliminated from this analysis due to their lack of provenience, leaving 258 sets for consideration. Horizontal, vertical, and total dispersal scores were calculated for each conjoined set, as described in Chapter 3. The results of this categorization are displayed graphically in Figure 9.12, and compared with the other five excavated features in Table C.2. Overall, there appears to be relatively little dispersal of fragments from the same broken element. In three-quarters of the cases, all members of a conjoined set came from the same or adjacent provenience units (TS scores of 2 or 3), and only 5% showed substantial dispersal (TS >6). Vertical dispersal (mean = 1.59) is slightly greater than horizontal dispersal (mean = 1.44): 72.1% of the reconstructed sets are from the same horizontal provenience unit (quadrant), and none shows greater dispersal value than 5. By contrast, 63.6% of the reconstructed fragments are from the same vertical provenience unit (level) as the other members of the set, and the maximum dispersal value is 7. These results seem to indicate that the broken bones were fragmented *in situ*, probably as a result of trampling or the fall of ceiling slabs, rather than as part of the mortuary ritual prior to deposition in the feature.

The few very dispersed sets are of interest for what they can tell us of post depositional disturbance at the site. These sets are of three types. Type 1 sets (n=6) contain fragments from deep levels of EU 6 and superficial levels of adjacent EU 2, EU 7, or both. Type 2 sets (n=5) are comprised of fragments from deep levels of EUs 1 and 3 and superficial levels of EUs 2 and 6. Type 3 sets (n=3) contain fragments from the upper four levels of EUs 2, 4, 7, and 8. The type 2 sets can probably be attributed to disturbance caused by the pothunter's pit that was visible in EU 1 at the beginning of the 1989 field season. The type 1 sets may have resulted from similar disturbance, although no traces of a pit were visible. Alternately, Skinner's removal of a large boulder from this area of the feature in 1987 may have disturbed the subsurface deposits of EU 6 and scattered fragments across adjacent units. The type 3 sets are more enigmatic, but since their constituents come from the innermost recesses of the feature, and are concentrated in the upper levels of the deposits, animal disturbance must be considered a possibility.

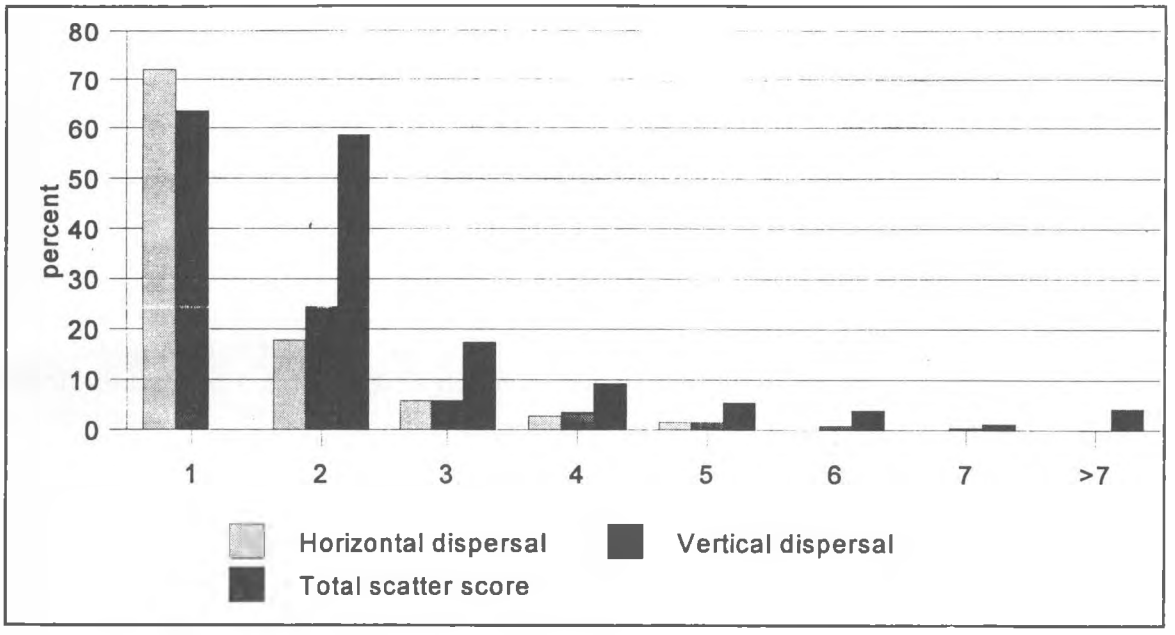

Figure 9.12 Dispersal scores of reconstructed fragments, DgRw 199-F9.

Demography

From the skeletal material he collected in 1987, Skinner estimated that a minimum of six individuals were interred at 199-F9, based on the presence of five mature distal left humeri and a single immature ulna shaft (Skinner 1991:56). This estimate was re-evaluated following analysis of the human remains excavated during the 1989 and 1992 field seasons, and a revised MNI of 18 was reached, comprised of 15 adults, 1 child, and 2 infants.

The estimate of 15 adults is derived from a count of mature mandibular mid-symphysis fragments with genial tubercles present. Due to the disarticulated and highly fragmented state of the human remains from this site, it is difficult to assess adult age or sex with any degree of confidence, other than to note that both sexes and all age classes from young adult to old adult appear to be represented. Pelvic bones, which convey the most unequivocal evidence of sex, are particularly poorly preserved in this collection, and only three were complete enough to sex. The cranial remains are better preserved, but afford less reliable sex estimates, particularly for populations such as this whose patterns of growth and development are not well understood. Of the 11 partial skulls for which tentative sex assignments could be made, seven (64%) appear to be male and four (36%) female. These estimates are based entirely on general impressions of size and robusticity of a relatively few cranial features (supraorbital ridges, mastoid processes, external occipital protuberance, zygomatic root, etc.), and should be accepted with caution. Tentative sex assignments were also given to 220 additional cranial fragments and post cranial elements whose size and robusticity were at the extremes of dimorphism for the sample: 129 of these (58.6%) were judged to be female and 91 (41.4%) male.

Adult age determinations are difficult even for relatively complete skeletons, due to the absence of unequivocal, chronologically specific bone changes once growth plates have fused and dental development and eruption are complete. Macroscopic methods of age determination rely primarily on degenerative changes in joints (osteoarthritis) and teeth (attrition), which in turn are affected by idiosyncratic variables such as general health, occupation, activity levels, and diet, in addition to chronological age. For a collection comprised mainly of disarticulated bone fragments and isolated teeth, only general impressions of age-at-death are possible. At 199-F9, the preponderance of heavily-worn teeth and the frequency of degenerative joint disease suggest that the collection is biased towards middle-aged and older adults. At least one young adult is present, however, as evidenced by the presence of a nearly complete innominate with recently fused iliac crest and incompletely fused ischial epiphysis, suggestive of an age-at-death of approxi-

mately 18-23 years (Stewart 1979). The presence of dorsal pubic pitting and a preauricular sulcus of the GP ("groove of pregnancy") type indicate that this individual was a young female who had already experienced at least one pregnancy (Houghton 1974; Kelley 1979; Stewart 1970).

The child is represented by a nearly complete mandible, four cervical and three thoracic vertebrae, two complete and eight incomplete long bones, and assorted pectoral, pelvic, and foot fragments. Since none of the elements is duplicated, and all are comparable in size and development, an MNI of one is suggested. Dental development and long bone lengths (Buikstra and Ubelaker 1994) are consistent with an age of 6-8 years.

A minimum of two infants less than one year of age are represented in the collection, based on the presence of numerous duplicated skeletal elements, including occipital, right and left frontals, right alisphenoid, right humerus, and left ulna. Age estimates of newborn to 3 months for Infant #1, and three to six months for Infant #2, were derived from long bone lengths and dental development, using the standards reported in Buikstra and Ubelaker (1994).

Subadults are generally under-represented in the assemblage, but the most striking feature of the demographic profile at 199-F9 is the total absence of adolescents. All of the immature remains identified in the collection are consistent with one of the three individuals described above, and none were found that could be attributed to an older subadult. Given that adolescent long bones are more similar in size, diameter, and cortical texture to adult bones than are those of very young individuals, is it possible that adolescent remains are present in the collection but miscatalogued as adult? This possibility cannot be entirely discounted, but the total absence of metaphyseal and epiphyseal fragments with the characteristic billowy surfaces of unfused growth plates (except those attributed to the child), and the lack of dental remains of the requisite developmental stage argues that the absence of adolescents is a real phenomenon.

Although immature remains were recovered from all excavation units, except EU 5, which yielded very few human remains, both infant and child remains tend to cluster in the southwest corner of the feature (Figure 9.13). The infant distribution is more diffuse than that of the child, perhaps because two individuals are represented.

There is an apparent correlation between age and mortuary treatment at 199-F9. The majority (66%) of the subadult remains are unburnt, and even those fragments which have been exposed to fire are rarely thoroughly burnt, or calcined (6.9%); this is in strong contrast to the adult remains from the same feature (26.1% unburnt, 31.6% calcined). Within the subadult category there is also a positive correlation between age and burning: only 24.8% of infant remains are burnt to some degree, compared with 40.7% of child remains. Burning in subadults tends to affect the face and teeth, the extremities (hands and feet), ribs, and vertebrae, while the cranial vault, limb bones, shoulder and pelvic girdle are generally unaffected. Among adults, there are no apparent differences in the burning patterns of males and females, although the number of fragments identified to sex may be too small to detect any real differences that might exist.

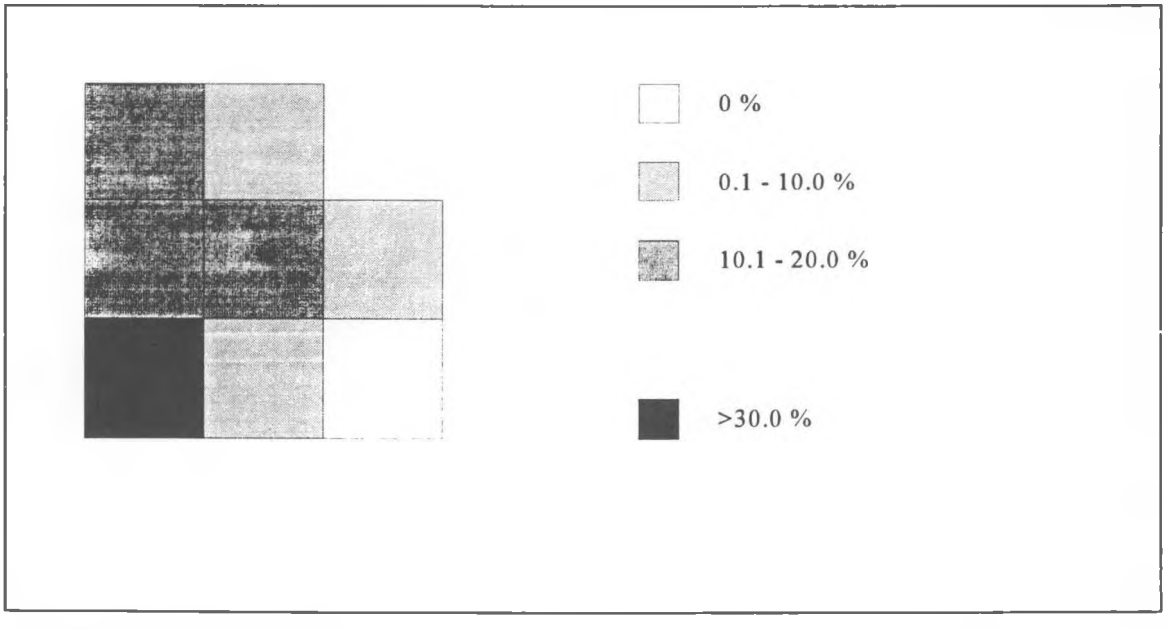

Figure 9.13 Horizontal distribution of subadult remains, DgRw 199-F9.

Demographic patterns in the five excavated burial features are compared in Appendix C, Tables C.3 and C.4.

Anomalies and Pathologies

The most prevalent pathological condition identified in this assemblage is **degenerative joint disease**, or osteoarthritis, which affects most of the major joints of the skeleton to a greater or lesser degree. Moderate to severe expressions were recorded in 21 cervical vertebrae (27% of sample), 66 thoracic vertebrae (41% of sample), and 23 lumbar vertebrae (31% of sample), which seems indicative of heavy loading stress on the vertebral column. Further evidence of vertebral stress was found in the high frequency of subluxation of cervical (n=13) and thoracic (n=11) vertebrae, and in the nearly universal occurrence of bony spurs on the vertebral laminae, resulting from ossification of the *ligamentum flavum*. Surprisingly few examples of Schmorl's nodes were seen (1 cervical, 2 thoracic, 2 lumbar), probably due to the poor preservation of vertebral centra.

In the appendicular skeleton, moderate to severe osteoarthritis is most common in the elbow (particularly the distal humerus) and wrist (especially the lunate), followed by the shoulder (proximal humerus), hand (proximal interphalangeal joint), knee (patella), and foot. Most of the degenerative joint disease in the foot occurs secondary to traumatic fractures of the affected joint (see below). Two mandibles and one temporal bone exhibit moderate to severe osteoarthritis of the temporomandibular joint.

Evidence of acute **trauma** was observed in 19 skeletal elements from 199-F9, including 18 bone fractures and 1 chronic dislocation; an additional 8 specimens exhibit evidence of chronic fatigue fractures (Table 9.4). All of the acute fractures are healed or healing, and none shows evidence of infection or other long-term sequelae apart from osteoarthritis. The infracranial examples can all be attributed to accidental injuries resulting from falls or other mishaps of a strenuous lifestyle, but the depressed cranial fracture and the mandibular fracture are probably the result of deliberate interpersonal violence (Ortner and Putschar 1981:79). Given the severity of degenerative joint disease in the vertebral column (see above), the observed frequency of compression fracture (n=1) almost certainly underestimates the true population frequency, no doubt due to the poor preservation of vertebral centra in general. The only affected thoracic vertebra exhibits an unusual midsagittal linear fracture of the inferior centrum with no compression or collapse; similar fractures were observed in the prehistoric population from the Tsawwassen site (Curtin 1991a), and in a larger skeletal sample from the Gulf of Georgia region (Beattie 1980: 243), but their etiology is unclear.

Fatigue fractures of the *pars interarticularis* (also known as spondylolysis) were observed on eight lumbar vertebra specimens: a centrum/superior arch; three complete inferior arches; one right inferior arch fragment; two right superior arch fragments; and one left superior arch fragment. The minimum number of individuals represented by these remains is four, yielding an calculated population frequency of 27% based on the estimated 15 adults represented in the assemblage. This is considerably higher than the estimated prevalence at 199-F1 (4/95 adults, or 4% affected), but lower than reported estimates at other sites in the Gulf of Georgia, including Tsawwassen (Curtin 1991a) and Birch Bay (Lundy 1981). Spondylolysis appears to develop in response to chronic stress to the lower back, as a result of heavy lifting, hyperflexion, or hyperextension (Merbs 1989).

One final form of trauma tentatively identified in the collection from 199-F9 is the culturally-imposed chronic low-grade trauma of **artificial cranial deformation**. None of the adult crania appear to be deformed, but both of the infants display flattening and focal resorption of the outer table in the vicinity of the frontal bosses and the external occipital protuberance, the two regions of the skull most directly affected by the pressures imposed in anteroposterior deformation.

Three additional types of **cultural modification** were noted, all affecting the teeth. A thin, shallow, linear groove was observed on the occlusal surface of a heavily worn upper right central incisor, running obliquely from distobuccal to mesiolingual; like the grooved premolar from 199-F1, this is attributed to the processing of plant fibres or animal sinews with the teeth. Shallow, polished grooves also occur in the interproximal cervical regions of three mandibular teeth, all from the same jaw. The affected teeth are the right canine (distal groove), right first premolar (mesial and distal grooves), and right second premolar (mesial groove). Interproximal grooves have been identified in skeletal material from a wide variety of archaeological contexts throughout the world, and are generally thought to have been produced by toothpick-like abrasion to remove impacted food particles (Ubelaker et al. 1969). This is a plausible explanation for the Gabriola example, given the severe dental crowding and malpositioning of the affected teeth.

The third type of dental modification is lingual surface abrasion of the anterior mandibular dentition, recorded in two jaws, including the one with interproximal grooves. The affected teeth in this jaw are

Table 9.4 Skeletal fractures, DgRw 199-F9.

Element	Portion	Description
skull	R. frontal	healed depressed cranial fracture
mandible	L. corpus	healed oblique fracture, anteroinferior margin
rib #3-9	sternal shaft	healing fracture with inferodorsal displacement
thoracic vertebra	centrum	midsagittal linear fracture of inferior surface
lumbar vertebra	centrum	severe compression fracture
lumbar vertebra	transverse process	oblique fracture with inferior displacement
lumbar vertebra	super. articular facet	medial margin fracture with slight displacement
lumbar vertebra	centrum/superior arch	complete bilateral spondylolysis
lumbar vertebra	inferior arch	complete bilateral spondylolysis
lumbar vertebra	inferior arch	complete bilateral spondylolysis
lumbar vertebra	inferior arch	complete bilateral spondylolysis
lumbar vertebra	R inferior arch frag.	spondylolysis of right arch
lumbar vertebra	R superior arch frag	spondylolysis of right arch
lumbar vertebra	R superior arch frag	spondylolysis of right arch
lumbar vertebra	L superior arch frag	spondylolysis of left arch
prox. hand phalanx	dist. articular surface	chronic dislocation, proximal interphalangeal joint
middle hand phalanx	prox. articular surface	inferior articular surface depressed
R. cuboid	dist. articular surface	crushing fracture of MT-4 and MT-5 facets
L. cuboid	dist. articular surface	crushing fracture of MT-4 and MT-5 facets
metatarsal #2	prox. articular surface	fracture of superolateral corner
prox. foot phalanx #1	prox. articular surface	avulsion fracture of inferomedial corner
prox. foot phalanx #1	prox. articular surface	avulsion fracture of inferolateral corner
prox. foot phalanx #2-5	prox. articular surface	depressed fracture of central articular surface
middle foot phalanx	prox. articular surface	avulsion fracture mid-superior margin
middle foot phalanx	prox. articular surface	avulsion fracture mid-superior margin
middle foot phalanx	prox. articular surface	oblique fracture of base
distal foot phalanx #1	prox. articular surface	depressed fracture of central articular surface

the two lateral incisors, which exhibit a high degree of polish on their lingual surfaces. Two teeth are also affected in the second jaw: the left central incisor, with strong lingual polish; and the right lateral incisor,with pronounced attrition of the lingual surface, including nearly total enamel loss. This abrasion is unlikely to have resulted from normal mastication, and is attributed to an undetermined task related function.

Several **developmental anomalies** affecting both the skeleton and the teeth were recorded in the assemblage from 199-F9. One of the skulls (C7:1) exhibits moderate asymmetry of the facial skeleton with the left half of the maxilla noticeably shorter than the right. The left side of the bony palate is depressed, resulting in a 4.5 mm difference in elevation at the maxillopalatine suture, and the vomer and perpendicular plate of the ethmoid are deflected to the right. Asymmetry of the muscle insertions on the inferior occipital and sphenoid is pronounced. A tentative diagnosis of congenital dysplasia secondary to hemifacial microsomia is suggested (Barnes 1994) but cannot be confirmed in the absence of the articulating mandible. This skull is unburnt except for localized charring of the anterior surface of the left maxilla.

Other anomalies of the axial skeleton include a sternal aperture, and four examples of vertebral border shifts. The first is a cranial shift at the cervicothoracic border: a 7th cervical vertebra with an elongated left costal process, or cervical rib. There are also two examples of caudal shift at the thoracolumbar border, expressed as lumbar ribs. The fourth example also occurs at the thoracolumbar border: a vertebra displaying an amalgam of T-12 and L-1 characteristics. The direction of the border shift in this case is unknown in the absence of the adjoining vertebrae.

Few developmental anomalies were noted in the appendicular skeleton, and they are limited to the foot: two instances of fusion of the fifth middle and distal phalanges, and one possible case of polydactyly, presenting as a large osseous spur projecting from the superolateral margin of the base of a left second metatarsal.

Developmental anomalies of the dentition include an incisally notched permanent left central incisor in the child's mandible (F9:3687); agenesis of the right central incisor in the same mandible; bilateral agenesis of the third molars in an adult mandible (C5/7:6); an unerupted transversely-oriented mesiodens in an adult maxilla (C6:8); and a fused/ geminated right lateral incisor in an adult mandible (C5/7:9).

Periosteal reactions suggestive of **infectious disease** are considerably less common and less severe than at 199-F1. Affected elements include one clavicle, one scapula, one ulna, two metacarpals, two phalanges, two fibula shaft fragments, six tibia shaft fragments, and 10 unidentified long bone shaft fragments. These remains are all consistent with a single individual, an adult male. All specimens exhibit mild to moderate sclerotic periostosis, and while no focal cavitations or gummatous lesions were observed, radiographic examination of the ulna and clavicle revealed a significant amount of endostosis. Another tibia from a second individual has a sabre-shaped morphology, but periostosis is not marked in this element. While these manifestations are not diagnostic of treponemal disease they are very similar to the milder lesions observed in material from 199-F1, where treponemal disease was confirmed.

Mortuary Practices

Despite the radiocarbon dates indicating substantial antiquity for the remains interred at 199-F9, Skinner eventually concluded that they (and all of the other cave and crevice burials along the False Narrows bluffs) had been placed in the rock feature relatively recently, in late prehistoric times (Skinner 1991: 48). The rationale for this conclusion seems to have been based on the widely held assumption that all cave burials on the Northwest Coast are late prehistoric or protohistoric in age. Although the high degree of fragmentation introduced some uncertainty, Skinner also felt that the remains he collected represented fairly discrete individuals, leading him to conclude that the bones in 199-F9 had been burnt *in situ*. The proposed scenario, then, appears to be that ancient bones were collected from their original burial place (presumably in a shell midden context) some thousands of years later, and placed as discrete secondary bundle burials within this cave feature, where they were subsequently burnt.

This scenario can be challenged on several levels. First of all, the discovery of several intact, articulated, primary burials in the False Narrows bluffs burial complex (Chapter 4) effectively disproves the thesis that the bluffs burials are all secondary redeposited remains. Secondly, the pattern of burning and fracturing apparent in the skeletal remains is one that is typical of the cremation of fleshed or green bones, not ancient dried bone. Finally, there is no evidence of extensive or intensive burning on the rocks forming the feature, nor were any fire altered rocks or ash layers encountered during the excavations, and only minimal amounts of charcoal were found. This suggests that the bones were not burned *in situ*, but that intact bodies were burned elsewhere, and the cremated bones collected and redeposited in the feature.

There is some support for Skinner's suggestion that the bones were deposited as discrete individuals, however. During the excavations particular note was taken of any elements that appeared to be in articulated anatomical relationship with other elements. Only three such instances were noted: a tibia and fibula in EU 2, level 1; three unburnt cervical vertebrae in EU 2, level 3; and an unburnt, badly weathered skull with two cervical vertebrae in EU 3, level 5. However, other groups of bones, attributed to the same individual on the basis of colour, size, robusticity, and anatomical traits, were found in close proximity to each other, although not in anatomical order. These include nine sets of vertebrae (each set consisting of 2-14 elements), six pairs of long bones, three pairs of hand bones, and one set of 25 foot bones. These findings support the cremation/disposal of single individuals rather than the mass cremation and deposition of the commingled bones of several people. The presence of cutmarks on some limb bones suggests that at least some of the bodies were dismembered prior to interment.

This vertical distribution of burnt and unburnt remains is suggestive of three phases of deposition at 199-F9, with the initial, possibly primary, interment of unburnt remains followed by predominantly cremated bones, concluding with additional unburnt remains, perhaps interspersed with cremations. A considerable amount of intermingling of remains from the three phases has undoubtedly occurred as a result of post-depositional taphonomic processes, including root and rodent disturbance, recent pits dug by pot-hunters, and the migration of small fragments downwards through crevices between rocks and boulders.

The low frequency of artifacts in general and total absence of items indicative of wealth or status seem to suggest that the individuals interred here were of relatively low rank in the social structure. The lack of shellfish and relatively low proportion of fish remains may also connote low rank, assuming that less elaborate mortuary ritual (including feeding the dead) accompanied their interment.