

## INDEX

- Abancay, 227, 229, 248 n. 40  
 Acari River, 39  
 Aco, 14, 104, 122, 135, 220, 222  
 Acobamba, 42  
 Acocro, 39, 42, 44, 247 n. 5  
 Acos, xxvii–xxviii, 42, 44–45, 198  
 Acosvinchos, 23, 39, 43–44, 246 n. 25, 247 n. 5  
 Acuchimay, 39, 211, 246 n. 29  
 agricultural activities, 60–61, 217  
   and pottery making, 131, 223–224  
   harvesting, 60, 223  
   planting, 60–66, 223, 224  
   plowing, 61, 171, 224  
   weeding, 60, 117, 223  
 agricultural crisis, 214, 216  
 agricultural land, 139, 216, 226, 228  
   affected by clay mining, 64, 207  
   amount available, 52–53, 126, 210  
   erosion of, 56, 69, 204, 210, 212, 213, 217, 231  
   expansion of, 209, 212, 217  
   quality of, 34, 49, 56–62, 126, 216, 231  
   shrinkage of, 213, 216  
 agricultural responsibilities, cultivation, 60, 223  
 agriculture, 34, 50, 210, 232  
   and irrigation, 28–29  
   and pottery making, in the present, 59–62, 69–70, 131, 223; in the past, 216, 231, 234  
   ecological zones with, 21, 22, 25, 69–70  
   in antiquity, 210, 214, 215  
   in the Andes, 218, 221, 223, 226  
   labor for, 59–60, 117, 217, 223  
   maize, 34, 60, 69, 138; and irrigation, 28–29, 31; in lower mountain savannah, 22, 25, 221  
   on the coast, 225  
 alcohol, cane, 66–67, 211  
 all-over design, 157  
 alpine rain tundra  
   in Andes, 218, 222–223  
   in Valley of Ayacucho, 21–23, 26, 30, 57, 67  
 altiplano, 47, 204, 218, 228  
 altitude, 22, 28, 31, 218, 242 n. 6  
*amaru* spirit, 91, 124–125, 128  
 analytical paradigm, 7–8, 72, 145  
 Anaolla River, 228  
 Ancash, Department of, 227  
 ancient ceramics, interpretation of, 112–115  
 Andahuaylas, 40–41, 134–135, 248 n. 40  
 Andean grains, 221  
   *see also quinoa*  
 Andes, ecology of, xxviii, xxx, 218–224  
 Angaraes, Province of, 41  
 animal effigy pots, 120, 198  
   *see also* bulls, llamas, parrot pots, sheep  
 animals, domestic, 60, 247 n. 12  
 Ankaptiana, 66–68, 96  
 Anta, 42  
 Antabamba River, 227  
 anti-vitamin E, 119  
 Añaqata, 32, 49, 193  
 apatite, 77, 78, 79  
 Apurimac River, 41, 218, 227  
*aqu*, *see* temper  
 Aquqata, hamlet of, 24, 49, 75, 245  
 Araypallpa, 221, 242 n. 21  
 archaeological interpretation, 1–2, 10, 236, 240  
 archipelago model, 126  
 Arqalla style, 41  
 artisan center, in Quinoa, xxiii, xxvi, 49, 66, 67, 137  
   description of, 50, 194  
   pottery production in, 54, 108–112  
 artisan demand, 129–130, 194–195  
 artisan market, 101, 129–130, 142, 239  
   distributive mechanisms for, 130, 136–139, 194–195  
   national and international, 14–15, 51, 130, 141  
   selective factors of, 194–195, 236  
   shapes sold in, 84, 91, 92, 94  
 ashes, 106  
 asymmetric unit, *see* fundamental unit of symmetry  
 Atacocha, 39, 178  
 Atahualpa, 15  
 Atarco Style, 40, 226  
 axis of symmetry, 153–158, 160–165  
   horizontal, 156  
   vertical, 158, 164, 167  
 Ayacucho, Battle of, 46–47, 139  
 Ayacucho, city of, 44, 51, 91, 94, 129, 248 n. 40  
   *barrio* of Carmen Alto, 211  
   *barrio* of Santa Ana, 48, 183, 220, 222  
   history, 40, 46  
   location, 16, 23, 29, 39, 130, 132, 229  
   merchant/intermediary from, 136–138, 194–195  
   pottery-making *barrio* in, xxvii, 48, 73, 183, 204, 220, 223  
   pottery-making process in, 177–178  
   vessels in museum in, 35, 37  
   weather in, xxiv, 18–21, 242 n. 5  
 Ayacucho market, xxvii, 131, 132–133, 134, 140, 142  
 Huayhuas pottery sold in, 134, 181, 182, 185  
 Ticllas pottery sold in, 134, 179

- Ayacucho, Plain (Pampa) of, 17, 29, 46–47, 97, 139, 245 n. 5
- Ayacucho Valley  
 as a transportation corridor, 211  
 culture history of, 34–41, 44, 197–200, 204–217
- Aymara, 14
- ayllu*, bilateral kin group, 33, 190
- ayni*, reciprocal work group, 117
- aysaku* shapes, 84–86, 88–91, 91–92, 116, 120–122  
 fabrication grammar of, 86  
*see also* liquid-carrying shapes, *puynu*, *tachu*, *tumin*, *yukupuynu*
- Azángaro, archaeological site of, 40, 216
- azugero*, 135, 182
- Bakuba textiles, 187
- balanced reciprocity, 128
- band patterns  
 and community design  
 correlates, 167–168, 186  
 and design structure, 146–152  
*passim*  
 definition of, 156–157  
 of Quinoa designs, 158, 160–163  
 variability of, 175, 177
- band symmetry, 165–177  
*passim*, 187, 195–196, 235  
 and “ugly” pottery, 191–192  
 in Huayhuas design, 183, 185, 186
- bands  
 and “ugly” pottery, 191  
 as lines, 169, 172  
 in black-and-red-on-white painting scheme, 100  
 in Pampay decoration, 180
- bargaining, 132
- barley (*Hordeum* sp.), 22, 25, 28, 55, 118, 221
- barrack-like quarters, in Huari, 35
- barrio* division of Quinoa, 27, 31
- basket-shaped pot, *see canasta*
- baskets, 22
- beans, various species of, 22, 25, 118
- bears, 91
- behavioral rules, of household composition, 189
- Betanzos, Juan de, 243 n. 14
- bifold rotation, 161, 163, 246 n. 7
- bilateral kin group, 32, 190
- bilateral symmetry, 154, 158–169, 185–187, 191  
 in Huayhuas design, 183, 185
- binocular microscope, xxvi, 75
- biotite, 73, 75, 77, 79
- black-and-red-on-white painting scheme, 93, 96, 99, 100, 129, 191, 192
- black-and-white-on-buff painting scheme, 92, 100, 103, 192, 193
- black clay, *see* carbonaceous clay
- black core, 208–209
- black paint, 68, 79, 151  
 in design, 165, 166, 167  
 minerals in, 99  
 on Killke pottery, 198  
 sources of, 65, 97
- blackened pottery, 107–108, 208
- Bolívar, Simón, 46, 139
- Bolivia, 27, 36, 38, 47, 198, 218–221 *passim*
- bowls, 140; *see plato*
- breakage of pottery  
 because of raw materials, 74, 110  
 during transport, 132  
 during use, 117, 138  
 in adverse weather, 54, 60, 69
- brewing pottery, 82, 83, 131, 208, 247 n. 24, 247 n. 25  
 from Huayhuas, 133, 247 n. 24  
 from Pampay, 247 n. 22  
 from Santa Ana in Ayacucho, 178
- bridges, 42
- brown sand temper, 78–79
- brush, for painting, 100
- buff paint, 97, 98, 99
- bulls, ceramic, 91–92, 95, 100, 125  
 and artisan market, 15, 139  
 use of, 120, 126, 128
- burnishing, 100, 147, 182, 186, 191  
 and community design  
 correlates, 165, 166  
 and strength of pottery, 99  
 in Killke-related styles, 198  
 stones for, 248 nn. 32 and 33
- burro*, 110
- Cabildo*, in Quinoa, 46
- Cabrapata, hamlet of, 178
- Cachi River, 39
- Cachimayo River, 39
- Cajamarca, 42, 45, 248 n. 18  
 environment of, 218, 219, 228, 229, 231, 248 n. 40
- Cajamarca Basin, 230, 248 n. 46
- Cajamarca Style, 211, 230, 248 n. 46
- Calcapirhua, 220
- calcite, 113
- Callejón de Huaylas, 227, 231, 248 n. 46
- Campa, 91, 125
- canal network, 27–28, 31, 58, 244 n. 18
- canasta*, ceramic, 135, 181, 182, 187
- candelabra*, 97, 102, 110–112
- candle holder, 80
- Cangalla, 179
- canteen, ceramic, 135
- capital, 69–70, 108
- Carás, 229
- carbonaceous clay, 107, 208, 245 n. 17
- Cardenas, Capitán Francisco de, 45
- careless decoration, 191, 195
- Carhuás, 229
- Carmen, Virgin of, 129, 190
- Carneiro, R., 209
- carrying capacity, 210, 212–213, 217, 231
- carrying patterns, 121–125
- cash crops, 55
- cash economy, 71, 200
- casta* kin group, 33
- Catholic beliefs and rituals, 124, 126, 240
- causation, and cultural ecology, 241 n. 6
- cautionary tales, 2
- Ccaccasiri, 220, 222
- central Andes  
 culture history of, 217–231  
 pottery making in, 217–224, 226–231
- central places, 133
- ceramic ecology, 4, 10, 115, 236
- ceramic raw materials, 233  
 analysis of, xxi, xxii, xxvii; *see also* clays, paints, temper  
 and ancient production, in Huari, 205–206, 212, 215;  
 in the Andes, 230, 231;  
 interpretation of, xxi, 114, 234;  
 on the coast, 226  
 and erosion, 57, 62–64, 71, 206, 217  
 and religious beliefs, 206–207  
 distances of, 67–70, 200–206  
*passim*, 234  
 procurement of, 64–67, 71, 72–73  
 transport of, 247 n. 12
- ceramic styles  
 ancient, 226, 228  
 complex, 231

- ceramics  
 and belief/mythology, 204  
 and environment, 115, 199, 200  
 and social organization, 204  
 and society, 204  
 as channel of information flow, 116, 124, 190, 210, 230, 233  
 as channel of nutrient flow, 116, 117, 122  
 exchange value of, 135–136  
 on the roofs of houses, 126–127  
 relations with culture, 115, 199, 204  
 ritual use of, 126–130, 204  
 systemic relationships with, 115, 199  
 technological advantages of, 203  
 technology of, 203, 239  
 ceremonial precincts, in Huari, 36, 213  
 Chalhuanca River, 227  
 Chamaya River, 228  
 chamber pot, 87, 124, 182  
*chamizo*, 55–56, 68–69, 100–106 *passim*  
 Chancas, 40–41, 46  
 Chanchapoyas, 248 n. 40  
 channels, ceramics as  
 for information flow, 9, 116, 124–129, 138, 190, 230, 233, 234, 247 n. 8  
 for matter and energy, 9, 116–117, 120–122, 138  
 shape of, 120, 122  
 Chaqiri, 77  
 Charamoray, 44, 221, 242 n. 21  
 Chasgón River, 228  
 Chavez, K., 14  
 Chavín Style, 36, 38  
*chaysaku* shape, 87, 100  
 Checca, 14, 222  
 Chicha River, 227  
*chicha*, vessels for, 84, 120, 127–129, 198, 245 n. 3  
*see also* maize beer  
 chicken, 92  
 Chiclayo, 227  
 Chilca, 101–102  
 Chilcas, 135  
 Chimbote, 227  
 Chinchá Valley, 216  
*chinwicha*, 101  
*chiqchi*, 101  
 Chitapampa, 220  
 chlorite, 74–79 *passim*  
 Choclococha, 41  
 choices, potters', 3, 15, 86, 91, 112, 115, 145  
 in decoration, 13, 98–100, 236  
 Chotano River, 228  
 chrysocolla, 211, 215, 248 n. 22  
 Chucuito, Department of Puno, 14, 222  
 Chumbivilcas, Province of, 44, 222  
*chunchus*, 91, 94–97, 110–111, 125–127, 246 n. 9  
 Chupas, market of, 211  
 churches, ceramic, 15, 95  
 channel of ideological information, 124  
 decoration of, 100  
 description of, 91, 93  
 marketing of, 139, 141  
 on *candelabra*, 110–111  
 on tops of houses, 126–127, 128  
 testing clays for, 112  
 Chuschi, 41  
 Cieza de León, Pedro, 41, 42, 243–244  
 circumscription, 209, 210  
 cisterns, 117  
 class distinctions, 32  
 classification, 7, 10  
 clay minerals  
 in clays, 74–76, 207  
 in paints, 98  
 in temper, 77, 207  
 clay sources  
 for brick making, 70  
 in Quinua, 57, 62, 65–66, 206–207, 245 n. 5  
 clays  
 analysis of, xxviii, 72–76  
 and religion, 67, 207  
 archaeological recognition of, 207  
 carbonaceous, 107  
 distance to, 67–68, 70, 200–201  
 drying of, xxiv, xxv, 54, 56, 80  
 filtering of, 108–109  
 for cooking pottery, 73, 76, 82  
 in eroded land, 16, 62, 69, 71, 206, 217, 231  
 in Huayhuas, 205  
 in Santa Ana, 178  
 mineralogical variability of, 74–75, 80, 206–207  
 physical properties of, 80–81  
 preparation of, 80–112  
 procurement of, in Quinua, 64, 112, 207; in Ticul, Yucatan, xxv  
 selection criteria for, 76, 78, 113–114  
 soaking of, 108, 110  
 storage of, 82  
 climate, 28  
 central Andean, 218–221, 231, 236  
 change in, 210, 213, 216, 227–228, 243 n. 1  
 climate and pottery making  
 in central Andes, 231–236  
 in Huari, 205, 214, 217  
 in Yucatan, Mexico, xxiii  
 on Coast of Peru, 224–226  
 closed systems, 8  
 cloud cover  
 in Ayacucho, 16–17  
 in central Andes, 218  
 in Quinua, xxiv, 18, 54  
 in various ecological zones, 21, 26, 69  
 in Yucatan, xxv  
 coast of Peru, 34, 36, 40, 211, 224–226  
*coca* leaves, 66, 67, 117, 126, 132, 211  
 Cocharcas, Virgin of, 128–129, 190, 246 n. 7  
 Colonial Spanish Period, 45–46, 197  
 color  
 classification by, 208–209  
 of fired pottery, 106–107  
 of paste, 236  
 Colquemarca, 222  
 community of potters  
 ancient, 236  
 definition of, 10–11, 233  
 design correlates of, 165–175, 183, 186–187, 194, 195–196, 235, 237–238  
 in Quinua, 48–51, 140, 233, 236  
 raw material correlates of, 11, 234, 249 n. 1  
 community self sufficiency, 27  
*compadrazgo* ties, 126–127  
 compressed zonation, 27  
 Conchopata, 36–39 *passim*, 208, 214–217 *passim*  
 Condebamba Basin, 230  
 Condebamba River, 228  
 cooking as detoxification, 117–119  
 cooking pots, 122, 178  
 distribution of, 133–135, 136, 246 n. 21  
 from Huayhuas, 131–135 *passim*, 247 n. 24  
 from Ticllas, 134, 178  
 similarity to chamber pot, 87  
 to detoxify plant foods, 117, 138  
 uses of, 82, 120, 131

- cooking pottery, 68, 82,  
 247 n. 25  
 analysis of paste, 75  
 clay for, 68, 73, 76, 79,  
 113–114  
 distribution of, 131, 133–135  
 for brewing, 120  
 from Huayhuas, 133, 182,  
 247 n. 24  
 from Pampay, 179, 180,  
 247 n. 22, 247 n. 23  
 from Santa Ana, 178  
 lack of decoration, 99  
 physical properties of paste,  
 74  
 size differences, 83, 208  
 uses of, 83, 131
- crack propagation, inhibition of,  
 74
- cracking, of pottery, 53, 78, 80,  
 100, 110
- craft products, non-ceramic, 58,  
 211
- creativity, 192, 236, 238  
 of individuals, 192, 196,  
 235
- Criquegas River, 228
- cristobalite, 75–77, 98
- crop storage, vessel for, 82
- crops, detoxification of,  
 117–119
- cross, 49, 124
- cross-cultural testing, 240
- Cross, Day of the Holy, 126
- Crowe, D., 153
- Culluchaca, 39, 68, 97, 108
- cultural change, xxxi, 9–10,  
 194, 196, 209–210, 239  
 and design variability, 236
- cultural ecology, 3–5, 12–15  
*passim*, 72, 139, 241 n. 6
- cultural evolution, 4, 239  
 processes of, 231
- cultural processes, 239–240
- culture historical explanations,  
 for production, 199
- culture history, 12  
 of central Andes, 228  
 of Quinua area, 34–47,  
 197–199
- cups, 84, 87, 100, 120
- Cuquibamba, 41
- Cuzco  
 city of, xxviii, 14, 135, 139,  
 229  
 Department of, 44–45, 134,  
 135, 219–222 *passim*  
 ecology of, 219, 248 n. 39  
 Inca period, 40–42, 198  
 Spanish period in, 45–46  
 Valley of, 34, 248 n. 18  
 Cuzco Polychrome Style, 44  
 cyanogenic glucoside, 118
- damaged pottery, 106
- Day of Pentecost, 49, 246 n. 8
- decision making, 11–13  
 paradigm of, 72
- decoration  
 and the community of potters,  
 11, 234–235  
 application of, 99–100, 102,  
 147–152  
 female participation in, 96  
 in Huayhuas, 181–183  
 in Pampay, 179–180  
 plastic, 95  
 varieties of, in Quinua, xxii,  
 15, 140–177, 183
- Deetz, J., xxv–xxvi, 198
- Deetz/Longacre hypothesis,  
 xxvi, xxviii
- demand, for pottery, 203,  
 234  
 in ancient Andes, 228, 230  
 in ancient Huari, 214–217  
 in the present, 117, 135, 236,  
 239–240  
 on ancient coast, 226
- descent patterns, xxviii, 199
- desiccation, 215–216
- design  
 aesthetic standards of, 190,  
 192, 195–196, 235–236  
 and adaptation, 237  
 behavioral principles of,  
 144–145  
 copying of, 198  
 interaction model of, 189  
 organization of, in Huayhuas  
 pottery, 181–183,  
 185–187
- design analysis, xxvii  
 and design variability,  
 175–177  
 application to archaeology,  
 237–238  
 behavioral steps derived from,  
 147–153  
 methodology of, 143–147  
 of Huayhuas pottery,  
 181–183, 184–186  
 sample used for, 140–143  
 symmetry used in, 153–175  
 use of shovels for, 238
- design and social organization,  
 xxv–xxvi
- design and society, xxv–xxvi,  
 188–196  
 correlates of social unit,  
 165–175, 237–238
- design elements, xxvi, 154, 158,  
 186, 189
- design fields, 144, 146–152,  
 158, 235, 237
- design layouts, 147–148, 167,  
 186, 191–192
- design organization  
 and community correlates,  
 167, 186, 195, 235–236,  
 237  
 and fields of design, 146,  
 148–152  
 and “style is symbol” model,  
 190–191  
 and variability of motifs, 159
- design patterning, 234–235,  
 237
- design space, 186  
*see also* design fields
- design zones  
 and community correlates,  
 167, 186, 195–196, 235  
 and Deetz/Longacre  
 hypothesis, xxvi  
 and design structure, 146–152  
 and variability of designs,  
 159, 175–177  
 and variability of motifs, 159
- definition of, 144, 246 n. 3  
 in Huayhuas, 182–183  
 on archaeological pottery,  
 237–238
- designs  
 content of, in Huayhuas, 184;  
 in Quinua, 160–163  
 control of, 189–190, 196  
 in Huayhuas, 184  
 in Quinua, 160–163
- detoxification, 138
- deviation amplifying feedback,  
 6, 8, 242 n. 12  
 at Huari, 213, 215  
 in Quinua, 70, 130  
 in the Andes, 228  
 on the coast, 224–225
- deviation counteracting  
 feedback, 8, 202, 242 n. 12  
 in Quinua, 54, 67, 71, 130
- direct historical analogies, 2,  
 200
- direct historical approach, 1, 7,  
 197–200, 233
- distribution of ceramics, 13–14,  
 47, 130–139
- double pots, 92, 96, 100, 120,  
 126–127
- dreams, 27
- drinking, 127
- drought, 213, 214, 216, 217
- dry season  
 in Andes, 218–219  
 in Ayacucho Valley, 16–17
- disadvantages for making  
 pottery, 70
- pottery made during, in  
 ancient Andes, 226; in  
 Andes, 220–221, 223; in  
 Huari, 216–217; in Quinua,  
 54–56, 60, 69

- dry season cycle (*michka*), 28, 57, 58, 61, 244 n. 18
- drying  
 ceramic raw materials, 80  
 raw materials, 202
- drying pottery  
 and “toasting”, 56  
 and weather, 70, 202, 223, 225, 233
- delay of, xxiii, 53, 60
- development of structures for, 71, 204, 228, 231
- effect of temper on, 78
- in artisan center, 50
- necessity of, 100, 102
- structures for, in artisan center, 50; in Yucatan, xxv; necessity of, 55, 69, 202; required for full-time specialization, 69
- structures not needed for, 226
- duck, 92
- duck, ceramic, 125–126, 128
- dung, 55, 102, 180, 182, 214
- eagle, 66
- Early Horizon period, 38, 210
- Early Intermediate period, 36  
 ceramic production in, 209–210, 217
- ecology of, 213, 217, 243 n. 1
- in northern Andes, 230
- sites in, 38, 213, 215, 244 n. 37
- eastern slopes of the Andes, 221
- ecological complementarity, 126, 139
- ecological niche, 69
- ecological paradigm, 145
- ecological zones, description of, in Andes, 218–221
- in Ayacucho Valley, 17, 21–26, 27, 242 n. 7
- Ecuador, 42, 123, 219, 246 n. 1
- elements, of design, xxvi, 154, 158, 186, 189, 234
- emic data, 143
- energy inputs, 68
- environmental space, socially constructed, 27
- equilibrium, and systems, 8
- erosion, 16, 46  
 and agricultural land in antiquity, 210, 212, 213, 217, 231  
 and agricultural land in the present, 56, 69, 204  
 and ceramic raw materials in antiquity, 206, 214, 231  
 and ceramic raw materials in the present, 62–65, 69, 73, 204
- ethnoarchaeology, 1, 240
- ethnographic analogy, 7, 199–200
- ethnographic homologies, 7, 200
- etic research strategy, 143
- Eucalyptus, 190, 245 n. 12
- evapotranspiration, 22, 25–26, 57, 218, 228, 248 n. 44
- evolution of the state, 209, 210–211
- exchange, 211  
 for pottery, 132, 135, 138  
 for pottery in antiquity, 215, 228, 230  
 interzonal, 26–27, 230  
 experimentation, 80, 183, 195, 214, 216  
 in design, 194, 236
- fabrication  
 grammar of, 86  
 of vessels, 12, 15, 17, 81–82
- faena*, corvée labor group, 117
- fallowing, of agricultural fields, 22, 69, 212, 213, 219
- feather, used for painting, 100–101, 182
- feedback mechanisms, 6, 8–9, 51  
*see also* deviation amplifying feedback, deviation counteracting feedback
- feldspar, 75–77, 79, 98
- fern motif, 159, 164, 167, 247 n. 7
- fertilizer, 56, 64
- fiestas, decline of, 210, 240
- figurines, 95, 100, 112
- finite designs, 157–165 *passim*  
*see also* motifs
- fire-blackening, 208
- fire clouds, 10, 102
- firebox, 102, 104, 106
- firing, 80, 100–108, 136  
 and raw material quality, 97–98, 110, 112, 208  
 and vessel damage, 106, 107–108  
 and weather, xxxiii, 53–55, 70, 217, 223, 231  
 atmosphere of, 108  
 control of, 102, 208  
 in Huayhuas, 181–182  
 in Pampay, 180  
 in Santa Ana, 178  
 open, 102–103
- flooding, 225–226
- flood plain, 25–26, 34, 70, 213–214, 228  
 ceramic resources in, 226
- floral motif, 167, 245 n. 12
- florero*, 134, 187  
*see also* flower pots, *masetero*
- flow of information, ceramics and, 9, 124–129, 138, 190, 234, 247 n. 8
- flow of matter and energy, ceramics and, 9, 120, 121, 138
- flower motif, 159, 190, 192, 193, 245 n. 12
- flower pots, 126, 128, 133–135, 178, 182  
 from Huayhuas, 181
- fog, xxiii, 18, 69, 223, 225
- food dish, for dogs, 87
- foothills of the Andes, 225
- forming apparatus, for pottery ancient, 208  
 in Quinua, 68, 81
- Fortaleza Valley, 248 n. 43
- frost, 28, 210, 218, 223–224
- fruits, 26
- fuel, 106  
 distance to, 68, 70  
 drying of, xxiii, 54–56, 101–102, 104, 202  
 in Huayhuas, 205  
 in Pampay, 180  
 procurement of, 102  
 sources of, 68, 214  
 transport of, 69  
 types of, 55, 100–102, 245 nn. 13 and 14
- full-time ceramic specialization and civilization, 209  
 and climate, xxiv, 69, 214  
 and demand, 204, 214, 234  
 and exchange, 215  
 and gender of potters, 203  
 development at Huari, 204–217, 238–240  
 development of, in central Andes, 231–232  
 ecologically favorable zones for, 224–231  
 in the Andes, 226–231, 236  
 location of, 224–231  
 on Peruvian coast, 224–225  
 role of fusion of ideology and ceramics, 210
- functionalism, 5
- fundamental motions of repetition, 156  
*see also* symmetry
- fundamental unit of symmetry, 153–164 *passim*
- Garcilaso de la Vega, 243 n. 14
- Gateway of the Sun, 38
- gender of potters, 62, 96, 203
- generalizations, of human behavior, 3–4
- genetic information, and technological information, 10

- geological setting, 16, 206  
 glacial action, 16  
 glide reflection, 157  
   *see also* slide reflection  
 goal-directed behavior, 6  
 goethite, 98  
 gourd bowl, 194  
 greatest diameter, measurement of, 83–88 *passim*, 120, 147, 208  
 grinding, for food detoxification, 119  
 Guaman Poma de Ayala, Filipe, 41, 43, 243–244  
 Guatemala, 122, 125  
   Valley of, 11, 242 n. 16, 249 n. 2  
 guerrilla activities, xxix, xxx, xxxi, 51, 210, 239
- Hagstrum, M., 14  
 halloysite, 74–79 *passim*, 98, 207  
 hamlet, definition of, 32  
 Hananacos, old name for Hanansayuc *barrio*, 44  
 Hanansayuc *barrio*, 44, 65  
   and ceramic raw materials, 68, 206  
   irrigation system of, 24, 27–31 *passim*, 58  
   potters from, 49, 51  
 handle, decoration of, 147–149, 193  
 Hardin, M., 186  
 harvesting, 60, 223  
*hatun tarpu*, *see* rainy season cycles  
 Hatun Wayqu Ravine, 27, 31, 117, 206, 215  
 height, measurement of vessel, 85, 88  
 hemagglutinins, 118  
 hematite, 98, 108  
 herding, 22  
 Hill, J., xxvi, 188  
 Holy Week Festivities, 137  
 Hopi, 188  
 horizontal reflection, 155–175 *passim*, 185–187  
 household-based production, xxv, 55, 189, 203  
 household tasks, compatibility of pottery making with, 203  
 Hualcán, 223  
 Huallaga River, 227  
 Huamachuco, 216, 228–231, 248 n. 18  
 Huamanga  
   city of, *see* Ayacucho, city of Province of, 16, 198, 220, 220  
   University of, xxix
- Huamanguilla, District of, 18, 48–50, 135  
   market in, xxvii, xxix, 50, 131–132, 140, 143, 182  
 Huamanguilla, village of, 42, 77, 125  
   location of, 18, 23, 39  
 Huamangura Ravine, 27, 30, 49, 77, 96, 98, 117, 215  
 Huancabamba, 228–229  
 Huancavelica, Department of, 14, 41, 221, 219–222 *passim*, 248 n. 39  
 Huancayo, 34, 47, 50, 122, 134–135, 219, 248 n. 40  
 Huanta  
   market in, xxvii, 131–133, 136, 140, 142, 182  
   province of, 49, 220, 222  
   town of, xxix, 68, 97  
 Huantos, hamlet of, 30, 56–57, 65, 132, 194  
 Huánuco, 42, 227–231 *passim*  
 Huaraz, 39, 229, 248 n. 40  
 Huari  
   architecture in, 35–36, 40, 216  
   ceramic resources for, 205–206  
   culture history of, 35–41  
   hypothetical model of ceramic production in, 212–217  
   location of, 17, 18, 23, 46, 47, 56  
   modern processes/ecology and, 204–209, 239–240  
   pottery produced in, xxii, 15, 210, 211, 230, 248 n. 46  
   relationship of Quinoa to, xviii, xxii, xxvii, 15, 139, 198  
   religious innovations in, 210, 214, 248 n. 31  
 Huarochiri, 43  
 Huarpa River, 227  
 Huayhuas, 39, 222  
   pottery from, 73, 131–135, 204  
   pottery production in, 48, 181–186, 220  
 Huaylacucho, 220  
 humidity, and Spanish settlement in Quinoa, 46  
 hurricanes, xxiv–xxv  
 hydrocyanic acid, 119
- iconography, 36, 39, 214  
 ideology, 15, 210  
 illite, 74–77, 80, 207  
 impact testing, 74, 99  
 Inca conquest, of Quinoa, xxvii–xxviii, 41–46, 139, 198  
 Inca Urcon, 40
- Incaqasa, hamlet of, 49, 96  
 Incas of Privilege, 42, 244 n. 29  
 individual choices, 13  
 individual potters, designs of, 193  
 information  
   coded in ceramics, 112–115, 193  
   reshuffling, 10  
 information transfer, genetic analogy of, 10  
 innovations  
   combining religion and pottery, 210–211, 214, 216, 217  
   in ceramic technology, 54, 55, 108, 110–112, 204  
   in design, 196, 236  
   in religion, 213, 248 n. 31  
   in vessel shape, 92, 94, 100, 208, 236  
 intensification  
   agricultural, 210, 212; *see also* fertilizer, irrigation, terracing  
   ceramic, 213–214; *see also* full-time ceramic specialization, specialization  
 intermediaries, as pottery middlemen, 136–138, 194–195  
 intermontane valleys, 221  
 intersubjectivity, in design analysis, 158  
 irrigation, 49  
   and agriculture, 28–31, 57–59, 60–61, 70  
   and domestic water, 117  
   and pottery, 138, 240  
   and social organization, 27–28, 30–31  
   in Ayacucho Valley in antiquity, 212–213, 215, 217  
   in lower montane savannah, 22, 24, 26  
   in the alluvial valley, 27  
   in the ancient Andes, 231–232  
   in the Andes, 223, 232  
   on the coast, 225, 226  
 irrigation canals, cleaning of, 61, 189–190, 223, 246 n. 12  
 iron minerals, 98, 208, 236, 249 n. 47  
 iron oxide, 98  
 isomorphisms, 6  
 isomorphous relationships, 7, 200–202
- Jargampata, 39  
 Jauja, 248 n. 39  
 Jincamocco, site of, 39, 216

- Juliaca, 229  
 Junín, Department of, 14, 219–223
- kaolin clays, 230, 249 n. 47  
 kaolinite, 74–79 *passim*, 98, 207  
*kichwa*, ecological zone, 26  
 “kicks”, in deviation amplifying feedback, 228  
 Killke-related styles, 44, 198, 247 n. 6  
 kilns,  
   and climate in Andes, 204, 228, 236  
   and climate on coast, 226  
   Andean, 104  
   in Quinua, 102–108 *passim*  
   Old World, 104  
   technological innovations in, 54  
 kin-based patterns, 32–33, 188, 243 nn. 27 and 28  
 kin groups, 32–33  
 kitchens, in Huari, 35  
 Kiturada, hamlet of, 49, 76  
 Kolb, C. C., 4
- La Libertad, Department of, 227  
 labor,  
   for agriculture, 59–60, 117, 217, 223  
   recruitment of, 28, 117, 120, 128, 138  
 Lagunillas, site of, 248 n. 27  
 Lake Titicaca, 36, 218–219, 228  
 Lambayeque, Department of, 227  
 Lampa, town of, 229  
 land, inheritance of, xxvi, 189  
 land tenure, 64, 67, 206–207  
 landless potters, 62  
 Larampampa, hamlet of, 30, 66, 74–75, 112, 245  
 Late Horizon, 44  
 Late Intermediate period, 44–45  
 layout types, 147, 246 n. 3  
   and design analysis, 238  
   and design variability, 159, 174, 176–177, 235  
   and painting schemes, 187  
   for *plato*, 152, 171, 173, 174  
   for *puynu*, 148, 168, 170, 174  
   for *tachu*, 150, 171, 175  
   for *yukupuyunu*, 146, 168, 171, 173  
 leaf motif, 159, 192–193  
 learning patterns, of making pottery, xxviii, 189, 193, 196  
 leather-hard vessels, 99
- Lima, 225, 229  
   display of ceramics in, 50  
   pottery made in, 137–138, 139, 240  
   pottery sold in, 104, 133, 136–138, 194  
   road from, 34, 45–46  
 limonite, 98  
 line width, 182  
 lines, as band designs, 165, 168, 172  
   on *plato*, 170, 171, 174  
   on *puynu*, 170, 174  
   on *tachu*, 151, 170  
   on *yukupuyunu*, 170, 171, 173  
 liquid-carrying shapes, 247 n. 25  
   from Pampay, 247 n. 22  
   from Quinua, 84, 86, 133, 138, 208  
   *see also aysaku* shapes, *puynu*, *tachu*, *tumin*, *yukupuyunu*  
 liquid-storage vessels, 86, 132  
   *see also aysaku* shapes,  
   cooking pottery, *maqma*, *inaqa*  
 literacy, 32  
 Llamahuilca, *pago* of, xxvi  
   design made in, 193  
   in irrigation system, 30–32  
   potters in, 48–49  
   raw materials in, 64–65, 73  
 llamas, 21, 25, 218  
   as pack animals, 26, 205  
   ceramic, 92, 95, 100, 126, 128  
 Llanza, 39, 179  
 lollipop motif, 159, 166–167, 193, 247 n. 7  
 Longacre, W., xxv–xxvi, 188  
 lower montane savannah, 17–18  
   agriculture in, 52  
   and Andean pottery making, 221–222  
   availability of dung in, 55  
   description of, 22–25, 34  
   division of, 26–27  
   in Luricocha, 126  
   in the Andes, 219  
   irrigation in, 29–30, 32, 244 n. 18  
   potters in, 48–49, 226  
   pottery making in, 70  
   quality of potter’s land in, 56–58  
   rainfall in, 20, 61–62  
 lower montane thorn steppe  
   agriculture in, 34, 49  
   and Andean pottery making, 205, 222–230 *passim*  
   and Huari, 17, 36, 205  
   and pottery making, 205  
   communities in, 126, 132  
   description of, 22–26, 29, 56–57  
   in Andes, 221–223  
   potters in, 70  
   lugs, on ceramic vessels, 180, 247 n. 23  
 Luo tribe, 242 n. 15  
 Luricocha, xxvii, 23, 39  
   *chunchus* in, 126–127  
   potters near, 48, 133, 183  
   pottery making in, 132, 179–180, 220  
   shapes made in, 73, 179–180, 204  
 Lurinacos, old name for  
   Lurinsayaq *barrio*, 44  
 Lurinsayaq *barrio*  
   and Acos, 44  
   ceramic raw materials in, 68, 73, 245  
   irrigation in, 24, 27–32, 58, 61, 244 n. 18  
   potters in, 48, 49, 51, 56, 61, 62, 189  
   quality of land in, 57–58  
 Lurinsayaq, *pago* of, xxvi  
   and irrigation system, 30–32  
   designs made in, 193  
   potters in, 48–49  
   raw materials in, 65–66, 77, 96, 245  
 Lurinsayaq Pampa, hamlet of,  
   61, 135, 245 n. 5
- Macachacra, Province of, 23  
 Machacca, Department of  
   Cuzco, 221, 242 n. 21  
 Machaqmarca, 222  
 magnetite, 108  
 maize  
   toxins in, 118  
 maize agriculture, 25–26, 34  
   and climate, 210–211, 221  
   and irrigation, 28–31  
   and population, 47  
   and scheduling conflict, 59–62  
 maize beer  
   and ceramic paste, 73–74  
   and exchange, 132, 215  
   and labor recruitment, 117, 138  
   drinking of, 120, 137  
   vessels used for, 82–87 *passim*, 120–121, 128–129, 138, 198  
 maize motif, 190, 245 n. 12  
 maize products, and vessel shapes, 120, 138  
 Manca Capac, 41  
 Manco Inca, 45–46  
*manka*, *see* cooking pots  
 Mantaro River, 47, 218, 227

- maqma*  
 for brewing maize beer, 82, 83, 120, 247 n. 25; *see also* brewing pottery  
 for use in making pottery, 82, 108  
 from Huayhuas, 135, 247 n. 24  
 from Pampay, 247 n. 22  
 thickness of vessel walls, 208  
 Marañon River, 218, 227–228  
 Marcapata, hamlet of, 178  
 marginal agricultural land, 138, 212–213, 215, 231  
 marketing pottery, 50–51  
*see also* distribution of ceramics  
 markets, 50  
 Acos Vinchos, 246 n. 25  
 Huamanguilla, 50  
 Huanta, 136  
 in Ayacucho Valley, 131–135, 138–139, 211  
 Quinoa, 26, 50, 131, 137, 142, 190–191, 195  
 marriage, 189, 190  
*masetero*, a plant pot, 186  
*see also* florero, flower pots  
*mashua* (*Tropaeolum tuberosum*), 22, 25, 242 n. 10  
 Matson, F. R., 4, 114  
 maximum threshold distances, to resources, 68–69  
*mediano*, 134, 182  
 Mesoamerica, 125  
 Mesozoic era, 16  
 metal binding constituents, 119  
 methodology, xxvi–xxvii  
 mica  
 in clay, 73–76, 80, 113–114  
 in paste, 74, 82, 207–208  
 in temper, 77, 79  
 in Ticllas clay, 178  
*michka*, *see* dry season cycle  
 micro-toxins, 119  
 Middle Horizon period, 34–41  
 and Quinoa ceramic production, 198, 204–205, 208  
 reconstruction of ceramic production during, 208–217, 230–231, 239  
 Middle Horizon styles, 226, 231  
*see also* Atarco Style, Cajamarca Style, Robles Moqo Style  
 middle range theory, 2  
 middlemen, 133  
 as pottery merchants, 136–138, 194–195  
*see also* intermediaries  
 migration, 27, 52, 209  
 in antiquity, 213–214, 217, 228  
 to Lima, 137, 210  
 minerals  
 potters' non-perception of, 78  
 potters' perception of, 113  
 physical properties of, 73, 98, 113  
 miniature vessels, 178  
*minka*, festive work group, 117  
 mirror reflection, 156  
*see also* bilateral symmetry  
 Mitchell, W. P., 14, 244–248  
*passim*  
*mitimaes*, 42  
*mitmaqkuna*, *see* *mitimaes*  
 Mito, 222  
 Mitocasa, 39  
 Moche Style, 226  
 Moche Valley, 248 n. 43  
 modeling, 81, 92, 95, 183, 198, 214  
 modern transportation, 247 n. 12  
*see also* truck transportation  
 modified coiling, 92, 183, 214  
 molds, use of, 97, 112, 183, 208, 248 nn. 32 and 33  
*molle*, *see* pepper tree  
 mono-causal thinking, 8  
 montane moist forest  
 as a niche for potters, 69–70, 222–223, 226  
 as a sacred zone, 67  
 fuel in, 56, 68, 101–102  
 in Ayacucho Valley, 17, 22–24, 28, 57  
 in the Andes, 218–219, 221  
 pottery exchange with inhabitants in, 27, 135  
 montane prairie  
 as a niche for potters, 223, 226  
 ceramic resources in, 67, 68, 96, 97, 98  
 description of, 21–22  
 herding in, 25, 26, 55  
 in the Andes, 218, 219, 221  
 location of, 17, 23, 57  
 pottery exchange in, 27, 135  
 montane steppe, 218–219, 228  
 montmorillonite, 74–80, 98, 108, 207  
 motif symmetry  
 and community design  
 correlates, 167–169, 195–196, 235  
 and “ugly” pottery, 191–192  
 and variability of design structure, 172–176  
 definition of, 154–155  
 of all designs, 160–163  
 of all vessels, 164  
 on Huayhuas pottery, 183, 185, 187  
*see also* finite designs  
 motifs  
 and black-and-red-on-white painting scheme, 100  
 and community design  
 correlates, 187, 234–235  
 and design structure, 175–177  
 and “ugly” pottery, 191–192  
 definition of, 154–155  
 in Quinoa compared with Huayhuas, 183, 184  
 in Quinoa designs, 160–162  
 of design, 158  
 on Huayhuas pottery, 181, 183–185  
 on Pampay pottery, 180  
 variability of, 159  
*see also* finite designs  
 motions of repetition, 158  
*see also* symmetry  
 motor habit patterns, 112, 121, 138  
 mountain god, 66–67, 211  
 mouth diameter  
 measurements of, 83, 85, 89, 90  
 role in restricting spillage, 120, 208  
 mouth size, measurement of, 84–86  
 muleteers, 211  
 Muqui, 222  
 Muruncancha, 65, 77, 110, 127  
 Museum of Art, Lima, 50  
 musicians  
 ceramic, 92, 95  
 playing at fiestas, 92, 137  
 mutual causal relationships, *see* feedback mechanisms  
 Muya, *pago* of, xxvi, 135  
 and irrigation, 30–32, 61, 244 n. 18  
 ceramic raw materials in, 65, 76, 96, 97, 245  
 decoration produced in, 193  
 potters in, 48–50  
 mythical themes  
 expressed in ancient Andes, 226  
 expressed in ceramics, 130, 232, 234; in ancient Huari, 36, 198, 210–211, 214, 217; in Andes, 228; in Quinoa, 91, 124–126, 138, 198  
 mythology, and vertical zonation, 27, 126



- Ñawim Pukyu  
 Early Intermediate period site, 39, 212, 213, 215, 246 n. 29  
 Inca period site, 44, 244 n. 37  
 Nazca ceramic styles, 226  
 Nazca Valley, 36, 40, 216, 226  
 neck diameter, measurements of, 85, 89, 90, 121  
 negative feedback, *see* deviation counteracting feedback, regulatory feedback  
 Ninabamba, 135  
 nitrate accumulator, 119  
 non-clay minerals, 75, 207 *see also* non-plastics  
 non-cooking pottery, 73, 74–77, 84, 113–114  
 clay for, 68, 78, 79  
 decoration of, 95–100, 140–177  
 fabrication of, 84–94  
 firing of, 100–108  
 temper for, 76–80  
 non-farm work, 53, 210  
 non-plastics, 78–79, 80, 112–114, 207  
 in clay, 76  
 perceptions of, 78  
*nopal* cactus, 242 n. 18  
 north coast, 227, 248 n. 43  
 nutritional needs, 9, 233  
  
 oats (*Avena sativa*), 25, 55, 118  
 obligatory design zones, 146–149, 159, 166–167, 175–177, 187, 191–192  
 obsidian, 211, 215  
*oca* (*Oxalis tuberosa*), 22, 25, 242 n. 9  
 offering, 66–67  
 Old World crops, 22, 221  
 one-dimensional patterns, 156, 157  
*see also* band patterns  
 optional design zones, 147, 149, 167, 175–177  
 Orcotuna, 222  
 organic model of society, 5  
 ornamental vessels, 91–96  
 oxidation, in firing, 106–108  
  
 Pacaycasa, 39, 132, 248 n. 27  
 Pachacamac, 40  
 Pachachaca River, 218, 227–228  
 Pachecuti, 41–42, 45  
 pack animals, 69  
*see also* burros, llamas  
*pagapu*, *see* offering  
  
*pago*, definition of, 30, 31, 193  
*see also* Muya, *pago* of; Lurinsayuc, *pago* of; Llamahuilca, *pago* of  
 painting, 53, 99–100, 101  
 in antiquity, 214  
 in Huayhuas, 183  
 male control of, 189, 196  
 painting schemes  
 in Huari, 198  
 in Quinoa, 183, 186  
 paints, 234  
 colors of, 186, 208  
 distance to sources of, 68  
 drying of, 54, 98  
 in eroded land, 217, 231  
 minerals in, 98, 108  
 physical properties of, 98  
 preparation of, 98  
 sources of, 96–98  
 used in Huari, 35, 198, 205  
 Pakaqaqa, 245 n. 5  
 Paleo-climate, 212, 213, 216  
 palm motif, 245 n. 12  
 Palm Sunday, 126  
 Pampamarca River, 227  
 Pampas River valley, 27, 41, 218, 227–228  
 Pampay, hamlet near Luricocha, 39, 179, 220, 222  
 pan pipes, 126  
*papaya*, ceramic, 87  
 Paracas ceramic style, 226  
 paradigm, 3, 5, 11–12  
 parrot pots, 120, 128  
 particle size, 78  
 part-time specialists, 53, 202  
 Pasco, Department of, 222  
 paste  
 analysis of, xxi, 75, 236  
 and settlement pattern, 236  
 and society, 11, 234  
 factors affecting, 236, 238–239  
 preparation of, 80–81, 110  
 soaking of, 82  
 standardization of, 238–239  
 storage of, 82  
 tempered, 83, 183  
 types of, 183  
 uniformity of, 113, 238–239  
 paste color, factors affecting, 11, 208–209, 236  
 paste description, scientific versus cultural, 113  
 Patampampa, hamlet of, 30, 49, 65, 193  
 Patarajay Style, 41  
 Patavilca Valley, 248 n. 43  
 patrilineal patterns, 32, 189–190  
 pattern mathematics, 158  
 Paucartambo, 248 n. 40  
  
 peas, various species of, 22, 25, 118–119  
 pepper tree, 26, 83, 242 n. 17, 245 n. 3  
 philosophy of science, 2–3  
 phlogopite, 73–79 *passim*  
 physical science techniques, 72  
*see also* binocular microscope, x-ray diffraction  
 pig, form of *amaru* spirit, 92  
 Pikillaqta, 39  
 Pisco, city of, 178  
 pitchers (*jara*), 87, 134–135, 182  
*see also* *puymu*  
 Piura  
 city of, 227, 229  
 Department of, 227  
 Pizarro, Francisco, 45  
 plant motif, 159, 166  
*see also* floral motif, flower motif  
 planting, 60–61, 224  
 plastic decoration, 182  
 plastic minerals, 114, 207  
 plasticity, 112  
*plato*, 48, 91, 194  
 community correlates of design, 165–167  
 decoration of, 97, 99–100, 141, 147, 151–153, 159  
 design organization of, 152  
 design variability on, 174–177, 238  
 distribution of, 131, 134, 195, 246 n. 21  
 exchange for, 132  
 size of, 86, 88–89  
 symmetry on, 169–174  
 use of, 84, 129  
*see also* bowls  
 Pleistocene, 34  
 plowing, 61, 171, 224  
 points of symmetry, 163  
 political setting, of Quinoa, 16  
 polychrome ceramic styles, xxii, 35, 37, 205  
 Pomabamba, 41  
 Pongora River, 39  
 poor agricultural land, 69–70, 126  
 population density, 218–219, 231  
 population growth, 71, 209–216 *passim*, 239  
 population of potters, *see* community of potters  
 population pressure, 204, 209, 213, 217  
 population size  
 in Andes, 218, 221  
 in Huari, 36, 209, 231  
 in Quinoa, 21, 24, 26, 244 n. 1

- porongos*, 135, 179, 245 n. 9  
 in Ticllas, 178  
*see also* *aysaku* shapes, water-carrying vessels
- positive feedback, *see* deviation amplifying feedback
- post-nuptial residence patterns, xxvi, xxviii, 188–190, 196
- pot covers, 135
- potatoes (*Solanum* spp.), 22, 25  
 cultivation of, 59, 61  
 exchange involving, 135, 211  
 in dry season cycle, 28, 57  
 toxin in, 118
- pottery  
 criteria for purchase, 131, 132, 136  
 green, xxiv, 54–55, 226  
 storage of, 54–55  
 use in ritual, 73, 126–130
- pottery making  
 equipment for, 248 nn. 32 and 33  
 in sixteenth century, 198
- pottery production and climate, 202, 204  
*see also* seasonality of pottery production; weather and climate, and pottery production
- pottery production and weather and climate  
 in ancient Andes, 226, 228, 231  
 in ancient Huari, 205, 213  
 in Quinua, xxii–xxiii, 53–56, 61–62, 131  
 in Santa Ana, 177  
 in the Andes, 223–224  
 in Yucatan, xxiv–xxv
- precipitation, 22  
 coastal, 224–225, 227  
*see also* rainfall, fog
- preferred threshold distances, 67, 70
- prickly pear cactus, 26
- processes of central and communication, 5  
*see also* feedback mechanisms
- processual analogies, 200–209, 217
- processual archaeology, 11
- Protestantism, 210
- protease inhibitor, 118
- protein, 28, 119–120
- Pucara, 14, 36, 38, 214, 220, 222  
 iconography of, 36
- Puccha River, 228
- Puerto Chicama, 227
- puna*, 246 n. 26  
 exchange of pottery in, 131, 135, 138, 139
- raw materials in, 67  
*see also* alpine rain tundra, montane prairie, *sallaqa*, sub-alpine wet paramo
- Puno  
 city of, 229, 248 n. 39  
 Department of, 14, 219, 222
- puynu*  
 and “ugly” decoration, 191–192  
 community design correlates of, 165–175  
 decoration of, 99–100, 147, 193  
 design organization on, 148, 149  
 design variability on, 194  
 designs on, 160–163  
 distribution of, 131, 133, 134–135  
 fabrication grammar of, 91  
 from Pampay, 247 n. 22  
 illustrations of, 87, 103, 145  
 size of, 88–90  
 symmetry of designs on, 158–159, 168–177 *passim*  
 use of, 84, 120, 141
- qiqatu*, 81
- quartz, 75–80, 98, 113, 207
- Quaternary, 16
- Quea, 222
- Quechua (language), xxvi, xxx, 40, 143, 178, 194, 197
- Quechuas, ethnic group of, 41
- Quehuahuilca, mountain of, 17, 39, 41
- Quelccaya Ice Cap, 212, 216, 230
- Quicha Chico, 135
- Quicha Grande, 14, 104, 135, 221, 223
- quinoa* (*Chenopodium quinoa*), 22, 25, 119, 242 n. 14
- Quinua, Spanish settlement of, 45–47
- Quispisisa, obsidian source, 211
- radial symmetry, 164, 246 n. 7  
 as a community pattern, 167  
 frequency of, 168, 169, 172–173  
 in Huayhuas pottery, 185, 187  
 on individual motifs, 159–163
- rainfall, 56–61, 70  
 amount of, in ancient Andes, 226, 228; in Andes, 219, 221; in Ayacucho Valley, xxiv, 16, 19, 22, 241 n. 4; in climate change, 210  
 and agriculture, 56–61, 70; in the Andes, 223–226  
 and irrigation, 28–31  
 and pottery making, in Andes, 228, 231; in Quinua, xxiii, 8, 71; damage to pottery, 102, drying, 54–56, firing, 106, scheduling, 59–61; in Yucatan, xxiii–xxv  
 and scheduling agricultural labor, 59–61  
 days with, 19, 59, 60, 62, 210, 241 n. 3  
 in Andes, 218–219, 221  
 in Ayacucho Valley (in antiquity), 16–19, 21, 216–217  
 lack of, on coast, 224–226
- rainy climate, and Spanish settlement in Quinua, 46
- rainy season, xxii
- rainy season and pottery making in ancient Andes, 223, 226  
 in Quinua, xxiii–xxiv, 54–56, 60–62, 70, 131, 234; *see also* rainfall and pottery making
- in Santa Ana, 177–178  
 in the Andes, 218–220
- rainy season, and irrigation, 28–31  
 and water supply, 117
- rainy season cycle, 28, 57, 61–62
- Rancha, hamlet of, 178
- Raqay Pampa, site of, 248 n. 27
- Raqch'i, 14, 220, 222, 242, n. 21
- ratios, of vessel dimensions, 83, 95, 90
- Ravines, R., 14
- raw materials  
 analysis of, 234  
 and settlement pattern, 236  
 ceramic, xxi–xxii, 11–12; *see also* clays, paints, temper
- dispersion of, 80, 206  
 drying of, 55, 110  
 grinding of, 110  
 in Yucatan, sources of, 113, 242 n. 15  
 mineralogy of, 113  
 on coast, 226  
 physical properties of, 80, 113  
 procurement, energy costs of, 206, 207  
 quality of, 108  
 sources of, 62–69, 113  
 storage of, 50  
 transport of, 137, 138  
 use in different communities, 238
- reciprocal obligations, of *chicha* consumers, 120
- Recuay, 248 n. 39

- Recuay Style, 230, 248 n. 46  
 red paint, 245 n. 10  
   and community design  
     correlates, 166, 167  
   found in ancient potters' workshops, 248 n. 33  
   minerals in, 98  
   on Acos pottery, 198  
   on *tachu*, 161  
   on "ugly" pottery, 191  
   sources of, 68, 97  
   used in Huayhuas, 182  
 red slip  
   and community design  
     correlates, 166  
   and firing, 209  
   and white-on-red painting schemes, 100, 147, 151, 153, 165  
   on "ugly" pottery, 191  
   used in Huayhuas, 182  
 red-on-white painting scheme, 245 n. 12  
 reflection, symmetry type, 156  
   *see also* horizontal reflection, vertical reflection  
 regulatory feedback, 6  
   and climate, 54, 61, 70, 204;  
   in the Andes, 218, 223, 228, 236; on the coast, 224  
   in Quinua, 66–67, 71  
   *see also* deviation  
     counteracting feedback  
 Relaciones Geográficas, 41, 43  
 relational paradigm, 145  
 relative humidity, and ancient ceramic production, 226, 236  
   and ceramic production, xxiv, 59  
   and drying pottery, xxiii, 53, 54, 59  
   in Ayacucho, 17, 20–21  
   in the Andes, 218  
   limitation of pottery  
     production, xxiii, 53, 54, 59  
   on coast, 225, 248 n. 43  
 religion, in ancient Huari, 213, 216  
 religious beliefs, in Quinua, 66–67, 71  
 religious symbols and pottery, 234  
   in Huari, 217, 228, 230  
 remittances, for Quinua residents, 52  
 repair of vessels, 102  
 replication, of ancient vessels, 199  
 re-soaking broken vessels, 96  
 re-soaking trimmed clay, 96  
 resource area, 64, 234, 238  
   249 n. 1  
 revitalization movement, 215–216  
 rim  
   decoration of, 147–149, 151, 193; in Huayhuas, 182  
 risk  
   of breaking pottery, 17, 56, 137  
   of innovation, 110, 112  
 ritual, 27, 126–129  
   pottery used in, 234; Andean, 226, 232  
 ritual distribution of pottery, 128, 129  
 ritual drinking, 128  
 ritual information, pottery as a channel of, 124  
 ritual pottery  
   raw materials for, 73, 83–84  
   used in Huari, 198, 210  
   used in Quinua, 91–92, 120, 126–128, 138, 198  
 river valleys of Andes, 225  
 road network, in Ayacucho Valley, 34, 47, 130  
 roads, Inca, 42  
   role in distributing pottery, 133, 139  
   to ceramic resources, 69  
 Robles Moqo Style, 35, 37  
 rocks, in paste, 110  
 root crops, *see* tubers  
 rotational symmetry, 246 n. 7  
   definition of, 154–155  
   frequency in bands, 170–175  
   frequency in motifs, 164, 168, 169  
   in community patterns of design, 166, 167, 186  
   in Huayhuas, 184–185, 187  
   in individual motifs, 159, 161, 163  
 Rumirumi, 135  
 sacred locations, 66–67  
 sagging, lack of, 82  
*sallqa*, 26, 67, 246 n. 26  
   *see also* *puna*  
 salt, 211, 215  
 San Juan de la Frontera de Huamanga, Villa of, 45–46  
 San Miguel River, 227  
 San Pedro de Cachi, 211  
 San Pedro de Curis, 179  
 Santa Cruz Pachecuti Yamqui, 243 n. 14  
 Santa River, 227  
 Santiago de Pupuja, 222  
 Santo Tomás, 44  
 Sarmiento de Gamboa, Pedro, 41, 42, 45, 243–244  
 savannah, *see* lower montane savannah  
 scheduling of pottery making and subsistence, 202–203, 234  
   conflicts in, 131, 223–224  
   in ancient Huari, 213  
   in Pampay, 179  
   in Quinua, xxii, xxiv, xxvi, 53, 59–62, 70, 217  
   in Santa Ana, 177–178  
   in the Andes, 223  
 scientific explanations, 3–4  
 seasonal flooding, 232  
 seasonality of pottery  
   production, 50, 71, 220, 224, 217–232  
 secular ideology, 240  
 selection, forces of, 12, 236  
   in design, 194–195  
 selling pottery, strategy for, 132  
 Sendero Luminoso ("Shining Path"), xxix, 210  
 Seq'ueraccay, 221, 242 n. 21  
 serpent, 92  
   *amaru* form of, 125  
 settlement pattern, of potters, 65  
 settlement patterns, 11, 116, 206, 233  
 sheep, ceramic, 100, 126, 128–129  
 Shepard, A. O., 153, 158, 246 n. 7  
 sherds, used in firing, 106  
 Shining Path (Sendero Luminoso), xxix, 210  
 Sicuani, city of, 248 n. 39  
 Sillar, W., 14  
 Simbilá, 225  
*sitios*, 30, 32, 193  
   *see also* hamlets  
 size ratios, of *aysaku* shapes, 85  
 slide reflection, 154–156 *passim*, 162–165 *passim*, 171–174 *passim*  
 slip and paint combinations, 234, 237  
 slips  
   analysis of, 98  
   application of, 96, 99–100  
   careless application of, 182–183, 191  
   causes of color change, 208, 236  
   consistency of color in community, 186  
   drying of, 53  
   experimental, 80  
   lack of, 147  
   minerals in, 98  
   multicolored, 35, 198, 214  
   physical properties of, 80  
   sources of, 205, 207

- soaking, for detoxifying plant foods, 118–119
- social class, 32, 48
- social groups below community, 26–32, 141, 236, 238  
*see also* Llamahuilca, *pago* of; Lurinsayuq, *barrio* of; Lurinsayuq, *pago* of; Muya, *pago* of; *sitios*
- social interaction  
 and design similarity, 13, 196, 235  
 as criteria for community of potters, 10–11, 233  
 in Quinoa, 190
- social space, in Quinoa, 26–33
- socio-political units, in Quinoa, 26–32
- Socos, 39
- Soras Valley, 216
- south coast, 204, 216, 224
- Spahni, J. C., 14
- Spanish  
 ceramic technology, 104, 197  
 conquest, xxiii, 40, 42, 45–46  
 culture, 32  
 settlement, 139  
 Viceroy, 46
- spatial layouts, *see* layout types
- spatial requirements, for making pottery, 55, 70
- specialization  
 at Huari, 204–217, 238–240  
 development of ceramic, 9, 11, 200  
*see also* full-time ceramic specialization
- specialized occupations, and population, 52–53
- squash (*cucurbita maxima*), 25–26
- staff god, 36, 216
- stamped decoration, 95, 179–180, 183
- standardization, 238–239
- stealing unharvested crops, 223
- Steward, Julian, 72
- storage, vessels for, 84, 247 n. 2
- storehouses, in Huari, 35
- stores, selling pottery in  
 in Ayacucho, 136–137, 138  
 in Quinoa, 138, 195
- storing pottery  
 necessity of, 56  
 structures for, 50, 71
- strap handles, 122, 124
- straw, 55–56, 60, 102
- stream cutting, 56, 62
- strength of pottery, 99
- style  
 and society, 188–196  
 issues of, 188  
 models of, 188–192  
 multiple painted, 198  
 social interaction model of, 188–189  
 transmission model of, 188–189  
 “style is symbol” model of style, 188, 190  
 styles, complex ceramic, 230  
 stylistic correlates of Quinoa, 165–175  
 sub-alpine wet paramo, 22–26  
*passim*, 57, 67, 218, 222–223  
*see also* alpine rain tundra
- subsistence activities, 58, 61, 69, 223–224
- subsistence agriculture, 52–53, 71, 210, 214
- sub-tropical thorn forest, 226, 229
- sub-tropical zones, 221
- Sucre, General, 46
- sunshine, 25–26, 29, 54, 218, 224–225, 236  
 days with, 20–21  
 hours of, 17
- Supe Valley, 248 n. 43
- Sururuyuq, 49, 245
- Suso, 39, 44
- symmetry  
 community design correlates of, 166, 167, 234, 235, 237  
 imperfect, 158  
 lack of, 164  
 types of, 153–157, 163; *see also* bifold rotation, horizontal reflection, radial symmetry, reflection, rotational symmetry, translation, vertical reflection  
 variability in, 159–177, 192, 238
- symmetry analysis  
 of Quinoa vessels, 144–145, 157–177  
 on Huayhuas vessels, 183, 185, 187  
 principles of, 153–157
- symmetry classes, and design layout, 172–173, 174, 175
- systems  
 formal properties of, 6  
 paradigm, 5–9, 10–11  
 terminology of, 6–9 *passim*  
 view of ceramics, 8, 10  
 view of culture, 5–7, 242 n. 12
- tachu*, liquid carrying shape and social units below the community, 193
- community design correlates of, 166, 167–168  
 decoration of, 99–100, 147, 165, 191, 194  
 design zones on, 142, 149, 151  
 designs on, 158  
 distribution of, 131–135  
*passim*, 195, 246 n. 21  
 layout types on, 150  
 size of, 85, 88–91  
 symmetry on, 170, 174, 175, 177  
 use of, 84, 120, 141
- Tambo, 39, 132
- Tambillo, 39
- Tantarniuq, 49, 73, 79, 80, 206, 245
- Tarabuco, Bolivia, 221
- Tarascans, 187
- Taricá, 220, 223
- Tarma, city of, 227, 229
- taya*, 101–102
- teapot, 87, 100
- teapu* vessel, 81
- temper, 83, 217  
 analysis of, 77–80  
 archaeological identification of, 207  
 brown sand, 78–79  
 clay minerals in, 77, 79, 110  
 differences from clays, 207  
 distance to, 67  
 drying of, 54, 80  
 mines, 66  
 preparation of, 80  
 sifting of, 110  
 sources of, 57, 62–65, 66, 70, 76–77, 206, 239; distance to, 67–68, 200–203; in eroded land, 231; near Huari, 205  
 storage of, 82  
 supplement (brown sand), 78–80  
 transport of, 69, 109
- temperatures  
 and maize agriculture, 28–29  
 and pottery making, in antiquity, 213; in the Andes, 218, 221, 226, 236; on the coast, 224  
 and pottery production, 53, 54, 69; in the ancient Andes, 223, 228  
 firing, 106  
 in Quinoa area, xxiii, 16–17, 18–22, 25–26, 57, 59, 242 n. 6  
 tempered paste, 99, 183  
 temples, 35–36, 213
- terracing, 212, 217
- tetera*, 87, 100

- theoretical generalizations, 199–200  
 theory development in ceramics, 239–240  
 thermal fracture, 74  
 thermal shock, 122  
 thorn steppe, *see* lower montane thorn steppe  
 threshold distances to resources, 200–203, 206  
 Tiahuanaco, 36, 38, 198, 214  
 Ticul, Yucatan, Mexico, xxv, 106–107, 113–114  
 Ticllas, 39, 222  
   making pottery in, 178–179  
   potters in, 48  
   pottery made in, 73, 134, 183, 204  
   seasonality of pottery making, 220  
*tinaqa*, liquid-storage vessel, 124, 180, 182, 247 n. 25  
   from Huayhuas, 134, 135, 182, 186  
   from Pampay, 179, 180, 247 n. 22  
   marketing of, 131, 133  
   painting schemes of, 92, 97, 100  
   use of, 86, 120, 127  
 Tinta, 222  
 Titicaca Basin, 214–215, 231  
 toasters, maize, 120, 133–135, 182, 187  
 toasting pottery, 56, 179  
 topography, 31, 117, 209  
 Toqtoqocha, Laguna, 39  
 Totorapampa, 222  
 tourist market, *see* artisan market  
 tourist pottery, 73  
 tourists, in Quinoa, 51  
 toxins, 117–119, 245 n. 1  
 trade, 36, 58, 211, 215, 228, 230  
 trade networks, 211  
 translation, symmetry type  
   as a community pattern of design, 166, 168, 191  
   definition of, 154–157  
   designs with, 161, 163  
   frequencies of, 165, 170–175  
   in Huayhuas designs, 185, 187  
 transmission of design, 235  
 transportation, 211, 234  
 transportation corridor, and Ayacucho Valley, 211  
   *see also* road network  
 transportation routes, 239  
 tribute, 36, 230  
 trimming of unfired vessels, 96  
 tropical forest, 34, 66, 126, 211, 218  
   Indians of, 91, 122, 125–126  
 tropical zones, 221  
 truck transportation, 69, 109–110, 136–137  
 Trujillo, city of, 227, 229  
 tubers, 22, 221  
 Trujillo, city of, 227, 229  
   cultivation of, 25, 210, 223  
   exchange for, 26–27, 135  
   *see also mashua, oca*, potatoes, *ullucu*  
*tumin*, 91, 99, 247 n. 24, 247 n. 25  
   carrying patterns for, 121, 122, 123, 124  
   demand for, 135, 136  
   from Ayacucho, 178  
   from Huayhuas, 133, 134, 182  
   from Pampay, 247 n. 22  
   mouth size, 83  
   thickness of vessel wall, 208  
   use of, 82, 84, 120  
 tumpline, 122  
*tuna*, cactus fruit, 26  
*tuqtu*, *see* toasters, maize  
 turntable, 208  
 turquoise, 248 n. 22  
 two-dimensional pattern, 157  
 typologies, *see* classification  
 “ugly” pottery, 136–137, 191–192, 195–196  
 Ukana, 179  
*ukumari*, 91, 95, 126  
*ullucu* (*ullucus tuberosus*), 22, 242 n. 11  
 undecorated pottery, 183, 193  
 uniformity, compositional, 239, 249 n. 2  
 unit of adaptation, 237  
 unit of analysis, 234  
 universal catchment area, for ceramic resources, 67  
 untempered paste, 99, 183, 207  
 updraft kiln, 102, 104, 208  
 Uqurumi, 30, 68  
 urban settlement, 228  
 urbanization, 209  
*urpu*, brewing vessel, 82, 83, 99, 120, 208, 247 n. 25  
   *see also* brewing pottery  
*urqu taytacha*, *see* mountain pot  
 Urubamba  
   Valley of, xxviii, 34, 218  
   village of, 221, 242 n. 21, 248 n. 40  
 utilitarian vessels, 84, 85, 99, 136, 195  
 Utkuchuku, 63–66 *passim*, 76–77, 78, 80, 110, 193  
*varayuq* leaders, 27, 127  
 variability, 12–13, 15  
   geological, 113, 206  
   in ceramic raw materials, 80, 113, 206–207  
   in color, 208  
   in design, 155, 171–172, 175–177, 191–192, 235–236, 237–238; *see also individual shapes: plato, puynu, tachu, yukupuynu*  
   in design space, 177  
   in design zones, 175  
   in handle design, 193  
   in layout types, 146, 148, 150, 152, 174  
   in motifs, 159, 164–165  
   in *plato* design, 167, 170, 171  
   in symmetry classes, 171, 174, 195–196  
   in vessel shape, 208  
   mineralogical, 74–80, 206–207  
   of design in Huayhuas, 182–183  
   of raw materials, 74–80, 208  
   paste, 207, 238  
   sources of, in design, 193–195, 235  
*vasinika*, chamber pot, 87, 124, 182  
 vector, 156  
   *see also* axis of symmetry  
 vegetables, 26  
 vertical reflection, 155–175  
   *passim*, 183, 186, 191  
   in Huayhuas design, 183, 185, 186  
   in Luricocha design, 180  
 vertical zonation, and cosmology, 27  
 vertically arranged ecological zones, 26–27  
 vessel shapes  
   and the community of potters, 11, 234–235  
   distinguishing ancient, 208  
   measurements of, 83, 85, 88–90  
   pre-Hispanic antecedents of, 197  
 vessel size, potters’ perceptions of, 85, 86  
 vessel walls  
   strength of, 100  
   thickness of, 208  
 Vilcanota, Valley of, *see* Urubamba, Valley of  
 Vilcanota River, 218  
 Vilcshuamán, 41  
 Villamalecita, Bolivia, 221  
 Villiger, F., 14  
 Viracocha, 40

- Viracochapampa, 39  
 virilocal residence, 189, 196  
 Viru Valley, 248 n. 43  
 volcanic ash, 62–64 *passim*, 83, 206, 239  
   in Guatemala, 249 n. 2  
 volcanic glass, 75–77, 98, 113, 207  
 volcanic tuff, 16, 66, 68, 207
- wage labor, 52, 62  
 wash basins, 87, 178  
 Washburn, Dorothy, 153, 158, 187  
 wasters, 110  
 water  
   scarcity of, 56  
   sources of, 116–117  
 water-carrying vessels, 48, 73, 116–117, 122  
   *see also* *puynu*, *tachu*, *tumin*, *yukupuynu*  
 Wayuniuq, 30, 49, 64, 97, 193, 245  
 Waywayuq, 30, 49, 97, 98  
 weather, 242 n. 5  
   *see also* climate, weather and climate  
 weather and climate, and pottery production, 202, 204  
   in ancient Andes, 226, 228, 231  
   in ancient Huari, 205, 213  
   in Quinoa, xxii–xxiii, 53–56, 61–62, 131  
   in Santa Ana, 177  
   in the Andes, 223–224  
   in Yucatan, xxiv–xxv  
   *see also* climate and pottery making, seasonality of pottery production  
 weeding, 60, 117  
 wet season, 16, 218  
 wet season cycle, 58  
 wheat (*Triticum* sp.), 22, 25, 55, 60  
 white paint  
   application of, 99, 100, 147, 151, 153  
   minerals in, 98  
   in Huayhuas pottery, 182  
   procurement of, 66, 96–97  
   quality of, 67  
   sources of, 65–68, 96  
   storage of, 82, 97  
 white-painted decoration, in Huayhuas, 182  
 white-on-red painting scheme, 94–95, 100, 165, 181, 191  
 wife of potter, role in pottery making, 96, 189  
 wine, product of trade, 221  
 work groups, 117  
 workshops, pottery, xxv, 202–203  
   in Huari, 207  
   in Lima, 137, 240  
   in Quinoa, 50–51, 112
- X-ray diffraction, xxvii, 74–77, 80, 98
- Yanaqucha Chica, lake of, 31, 39, 67, 96–98  
 Yanaqucha, lake of, 39, 44  
 Yanque, 44  
 Yaucay River, 39  
 Yucatan, Mexico, xxi, xxv, xxxiii, 122–124  
*yukupuynu*, liquid-carrying shape  
   and “ugly” decoration, 191  
   community design correlates on, 165–175  
   decoration of, 99, 100, 147, 193  
   design organization of, 146, 149  
   designs on, 160–163  
   distribution of, 131, 133, 135, 246 n. 21  
   fabrication of, 91  
   illustration of, 86, 104, 143, 144  
   size of, 88–90  
   symmetry of designs on, 158–159, 168–177  
   use of, 84, 120, 141  
   variability of designs on, 194  
 Yupanqui, 40–42
- Zaire, 187  
 Zuidema, R. T., xviii, xxviii, 244 n. 28, 244 n. 36