

Index

Note: **Bold** page numbers refer to tables and *italic* page numbers refer to figures.

- AAR. *See* amino acid racemization (AAR)
- Abdalla, R. R., 348
- Absolonova, K., 257
- Accuracy Analyzer™ tool, 180
- ACTB gene, 218
- AD 79 eruption, 407–411, 417, 419–420, 423, 428–430
- bioarchaeological and taphonomic study, 413–418
- causes of death, 418–420
- date of, 410–411
- historical and archaeological reconstructions, 411–413
- Adovasio, J. M., 44
- Adserias-Garriga, J., 217
- airline crash case, 151–156, 155–160, 160
- alcohol use disorders (AUD), 348
- alternative light sources (ALS), 299–300
- Alunni, V., 176, 183
- Amadasi, A., 178, 182
- amino acid racemization (AAR), 202–204, 203
- AmpFISTR
- Identifiler, 215, 219–220, 222–223
- MiniFiler, 216–217
- NGM PCR Amplification Kit, 220
- Profiler Plus, 219
- SGM Plus, 216–217
- AmpFLSTR Identifiler, 219
- anatomical regions, 124, 338, 341, **342**
- Ancestry Informative Markers (AIMs), 223
- ancient DNA extraction (aDNA), 223
- ANDE Rapid DNA identification system, 224–225
- Anderson, T., 140
- ante-mortem (AM) identity, 147, 150, 154, 155, 160–162, 165, 363
- anthropological methods, 76–78
- artiodactyls (cloven-hooved mammals), 254
- Aubrey Hole (AH7), 282–283
- Auger, N., 347
- avascular necrosis, 243
- Avellino Pumice event, 417
- Baby, R. S., 2, 6, 76
- basic lamellae, 253
- Bass, W. M., 317
- Beckett, S., 257
- Belgium, 277, 283–285
- Bell, L., 252, 254–255, 258, 265
- Bennett, J. L., 5, 171
- BFT. *See* blunt force trauma (BFT)
- BigDye Terminator Cycle Sequencing Kit (Thermo Fisher Scientific), 216
- Binford, L. R., 2
- bioapatite, 274, 276, 325
- biological profile estimation, 135–137
- approaches to, 140–142
- metric methods, 139–140
- morphological methods, 137–138
- Black, S., 396
- blast injuries, 384
- blunt force trauma (BFT), 172–174, 175
- bone
- alteration, 116–120, 118
- color changes, 117
- color progression, 117, 118
- dehydration (*See* dehydration)
- dimensional changes, 119

- exposure, 2, 15–16, 16, 83–86, 84, 88, 89–90, 90–94, 343
- lining cells, 194
- macroscopic and microscopic shape, 168–169
- shrinkage, 119–120
- warping, 314
- bone fracture biomechanics, 167–168
 - blunt force trauma, 172–174, 175
 - cranial and irregular bone, 179–181, 179–182
 - fresh bone, 168–169
 - gunshot trauma, 177–178
 - heat fractures, 171–172, 172
 - sharp force trauma, 175–177
 - thermal damage, 170, 170–171
- bone remodeling unit (BMU), 253
- bone tissue, 242–243, 250
 - primary, 242–243, 250–252
 - qualitative analysis, **244–249**
 - secondary, 252–254
- bone transformation
 - amino acid racemization, 202–204, 203
 - colorimetry, 196
 - differential scanning calorimetry, 202
 - Fourier transform infrared-spectroscopy, 198, **199**, 199–200, 200
 - heat and, 195
 - Raman spectroscopy, 200–201, **201**
 - SEM-EDX, 196–198
 - temperatures, 205–208
 - thermogravimetric analysis, 202
 - X-ray diffraction, 201–202
- bovine metacarpal bones, 215–216
- Bradtmilller, B., 3, 256
- Bragg's law, 201
- Brazil, 101, 220, 345–346
 - forensic anthropology, 353–355, 354–365, 359–362, 364–366
 - homicide rates, 346–347
 - microwave oven, 348–353, 349
 - urban violence, 348
 - violence rates, 346
- Brindley, A. L., 273
- Brits, D., 251
- Brooks, T. R., 5
- Brown, S. O., 251, 255–256, 263, 266
- Buikstra, J. E., 3, 256, 258, 323, 396
- burning
 - on bed, 21, 21–22
 - biological profiling, 135–137
 - conditions, 323
 - on couches, 19–21, 20
 - degrees of, 114
 - on floor, 19, 19, 22, 22–23
 - human body, 14–17
 - human identification, 134–135
 - outdoor debris piles, 30–31, 30–31
 - on recliner, 19–20, 20
- burn line fractures, 119
- burnt bones
 - histology, 256–259
 - locating and identifying, 299–300
 - post-fire fragmentation of, 31
 - quantifying and analyzing, 301–302
 - reconstruction, 302–305
 - visual capture and documentation, 300–301
- burnt human remains, 75–76
 - anthropological methods, 76–78
 - five-year intervals, 338–339, **339**, 343
 - garage fire case, 92–94, 93–94
 - geographic region, 338, 340, **340–341**, 343
 - history of, 1–6
 - materials and methods, 337–339
 - medicolegal classification methods, 78–79
 - new classification model, 79–82
 - structure fire case, 86, 86–90, 88, 90
 - trench case, 90–91, 91–92
 - vehicle fire case, 83–85, 84–85
- burnt skeletal remains, 321, 325–328
 - burning conditions, 323
 - challenges, 313–320, 315–316
 - composition, 323–324, **324**
 - inventory and record, 323
 - post-burning management, 323
 - research potential, 324–327
 - skeleton selection, 321, 322
 - 21st Century, 320–321
- burn victims, 4–5, 103, 108–110, 343
- Bush, M. A., 5
- Butte County California wildfire, 136, 372, 378, 381
- Byard, R. W., 135
- Cain, C. R., 258
- calcination, 34, 75, 77, 82–84, 85, 86, 86–88, 90–91, 91, 93, 124, 141, 176

- calcined bone, 16–17, 28, 117–118, 118, 256, 273–277, 281, 284, 284, 293, 375
 California, 371–372, 374
 The Camp Fire, 371–375, 373, 376–378, 377–378, 380–381
 canaliculi, 252
 carbon exchanges, 277–281
 carbon monoxide hemoglobin (CO-Hb), 106, 108
 carboxyhemoglobin (COHb), 136
 Castillo, R. F., 257
 Cattaneo, C., 258
 Cavazzuti, C., 4
 Cavka, M., 140
 CCMs. *See* curvature color maps (CCMs)
 CEI/XXI Collection, 315–316, 318, 320–321, 322, 323, **324**, 326–327
 Cellmark Forensic Services (CFS), 385, 387
 cementum, 120–121, 148, 314
 central nervous system (CNS), 429
 Cerezo-Roman, J. I., 6
 CGS. *See* Crow-Glassman Scale (CGS)
 chairs, furnishings, 20–21
 Chandler, N. P., 3
 charring, 77, 83–86, 90, 173, 352, 421
 Christensen, A. M., 5, 68, 140, 174
 chroma, 230, 232
 Chudek, J. A., 140
 CI. *See* crystallinity index (CI)
 CIE L*a*b* (CIELAB) uniform color space, 196, 231, 231
 circumferential lamellae, 253
 Clag® paste, 67–68
 Clarence Center Protocols, 54
 CloudCompare, 302, 304
 COD/MOD, 40–41
 Collegium Augustalium, 427, 428
 Collini, F., 177
 colorimetry, 196, 230–232, 231
 advantages, 231–232
 case study, 233–236, 234–235
 challenges of, 232–233
 combustible fuels, 17–19, 27–28, 30
 complete cremation, 102, 352
 comprehensive search technique, 45–46
 compression phase, 351
 computed tomography (CT), 109, 109, 140, 300–301
 confined space fires, 28, 28–29
 controlled destruction, 44, 55
 conventional microscopy, 295
 coroners/medical examiners (C/ME), 38, 40, 45
 couches, furnishings, 19–21, 20
 Coulombeix, A., 135
 cranial bones, 32–34, 124, 169, 171, 179–181, 179–182, 283, 375
 cremated bone, 140–141, 256–257, 259, 264–266, 281–282
 qualitative and quantitative analysis, 259, **260–261**, 262, 262–264
 cremation, 353
 complete, 102, 352
 incomplete, 185, 257, 352
 partial, 352
 signature changes, 122–129, 122–129
 criminal immolation, 101–102
 Crowder, C., 265
 Crow-Glassman Scale (CGS), 76–78, 105, 115
 Crow, R. M., 4, 352
 crushing, 28, 31, 33–34
 crystallinity index (CI), 198, 202, 208
 Cuijpers, S., 252, 255
 curvature color maps (CCMs), 179–180, 180–184
 curve transverse fractures, 119
 cyanamide, 274
 DAFS. *See* Department of Applied Forensic Sciences (DAFS)
 dahllite, 193–194
 death, 418–420
 dowry, 101
 fire, 99–100, 100
 medicolegal determination, 105–108, 107
 See also microwave oven death
 debris pile, 29–31, 30–31, 45–46, 47, 48, 54
 decomposition, 13, 81, 119, 123, 136, 170, 195–197, 202, 206–207, 229, 426, 428
 Degenhardt, L., 348
 DeHaan, J. D., 5, 18
 dehydration, 103, 116, 119, 170–171, 195–196, 206, 229, 345, 352, 384, 426
 delamination, 108, 119, 124, 127, 173, 384
 de Lourdes Chavez-Briones, M., 222–223
 dense Haversian, 253–255, 263, 265–266
 dental evidence, 67–69
 dentine, 121, 195
 Department of Applied Forensic Sciences (DAFS), 53–54

- Deputy SIO (DSIO), 387, 393
dermis tissue, 115, 116
diaphyses, 117, 119, 127, 128
differential scanning calorimetry (DSC), 202
digital imaging, 301, 303, 305–307
digital photography, 14, 295, 299
digital radiographs (DR), 222
Dirkmaat, D., 43–44, 53
DNA, 204–205, 204–205
 damage, 221–222
 evidence, 66–67
 extraction, 214, 218–223, 225, 264, 346
 integrity, 221
 profile, 67, 204–205, 214–223, 225, 402
documentation, 40–46, 48, 54–55, 60, 292,
 295, 298, 300–301, 304–306, 379
domestic cattle, 255
domestic pigs, 255
double homicide case, 161–162,
 162–164, 165
driver and passenger space, 25, 26
Duffy, J. B., 4
- Early Access AmpliSeq Mitochondrial
Panel (Thermo Fisher Scientific), 223–224
early alert system, 46
Eckert, W. G., 4, 76–77, 115, 352
Ellingham, S. T., 5, 197, 200, 202–203
Elwick, K., 224
Emery, M. V., 223
enamel, 120–121, 121, 125, 139–142, 148,
 149–150, 314
endosteal lamellae, 253
energy dispersive spectroscopy (EDS),
 156, 159, 165, 301
energy dispersive X-ray spectroscopy
 (EDX), 197
Enlow, D. H., 251, 255–256, 263, 266
epidermis tissue, 115
epiphyses, 127, 128, 138, 168
equilibrium and pyrolysis phase, 351
ethical and legal considerations, 305–306
excavation strategy, 389–394
extensive burn destruction, 353
EZ1 Tissue Kit (Qiagen), 220
- Fabricius Hidanus, G., 114
Fairgrieve, S. I., 5, 176
Fais, P., 178, 183
Falys-Prangle method, 326
- FAR. *See* forensic archaeological recovery
 (FAR)
fatal fires, 13, 29, 31–34, 37–41, 40,
 43–44, 75, 95, 113–115
 documentation, 41
 outdoor, 29
 recovery and transport, 33–34
 victim recovery protocols, 42–43
Federal Bureau of Investigation (FBI),
 337–338, 340, 343
Fell, C., 140
Fenton, T. W., 173–174
Ferreira, S. T. G., 220, 321
fibrolamellar bone, 243, 251–252, 255
fire
 confined space, 28, 28–29
 damage to the body, 102–103, 103, **104**
 death statistics, 99–100, 100
 debris, 13–14, 16, 18–25, 27–28, 30–31,
 30–35
 degree of damage, 103–105
 environments, 17–18
 experimental research, 14
 modification, 352
 outdoor space, 29
 structure, 18
 in the USA, 39
 vehicle, 24–25
fire exposure, 18, 105–106, 113–114,
 123–124
 bone alteration, 116–120, 118
 soft tissue alterations, 115–116
 teeth alteration, 120–121, 121
first degree burns, 103–104, 114
five-year intervals, 338–339, **339**, 343
floor
 burning, 19, 19, 22, 22–23
 collapse, 23, 23–24
Folkens, P. A., 396
Forbes, G., 256
ForenSeq DNA Signature Kit, 224
forensic anthropology/anthropologist,
 37–38, 40–46, 49, 50, 51, 55, 75,
 78–79, 115, 167, 185, 317, 319–320,
 337, 346, 383, 385, 387, 395, 402
 role of, 353–355, 354–365, 359–362,
 364–366
 team, 38, 53, 55, 359
forensic archaeological recovery (FAR),
 38–39, 41, 43–46, 47, 49, 53–55

- forensic cases, 218–221
 formalin, 179
 Fourier transform infrared-spectroscopy (FTIR), 198, **199**, 199–200, 200, 207–208, 221
 fractography, 173–174, 175, 183
 fragmentation, 5, 17, 19, 23, 31–32, 34, 41, 45, 47–48, 54, 76–77, 81–82, 90–91, 91, 126, 126–127, 385
 Fredericks, J. D., 221
 fresh bone
 biological and chemical makeup, 193–195
 fractures, 168–169, 174
 Friedlander, H., 179–180, 183
 furnishings, 14, 18–24, 29, 31–32
 fusion, 119, 170, 196–197, 208, 257, 264
- Galloway, A., 174
 Galtés, I., 173–174, 183
 garage fire case, 92–94, 93–94
 Garcia, A., 214
 Garrido-Varas, C., 6, 136
 Gaudio, D., 224
 Gejvall, N., 2
 geographic region, 338, 340, **340–341**, 343
 Gilchrist, R., 256
 Ginart, S., 222
 Gin, K., 224, 381
 Girtzlehner, M., 79
 Glassman, D. M., 4, 352
 Gonçalves, D., 135, 139, 325
 Grevin, G., 5
 Grupe, G., 141, 256
 gunshot residues (GSR), 178, 182–183
 gunshot trauma (GST), 172, 174, 177–178, 182–184
 Gustavson, K. H., 179
- Hanson, M., 258
 Harbeck, M., 205, 214
 Harcke, T., 222
 Hartman, D., 219
 Harvig, L., 140
 Haversian bone, 195, 243, 252–253, 255–256
 heat exposure, 14–16, 107–108, 116, 313–314, 327
 bone dimensional changes, 119
 teeth alteration, 120–121, 121
 thermal damage, 170, 170–171
 heat fractures, 171–172, 172
 heat hematoma, 106–107, 107, 415, 415
 heat-induced
 changes, 134
 fractures, 117, 118
 shrinkage, 119–120
 heat on bone, 384–385
 Heglar, R., 3
 Helmand Province, 385, 386
 Herculaneum, 135, 234, 276, 407–408, 409, 410–423, 416, 425–427, 428, 429–430
 Herrmann, N. P., 2, 5, 171, 256–257
 HID-Ion AmpliSeq Ancestry Panel (Thermo Fisher Scientific), 223
 Hillier, M. L., 252, 254–255, 265
 histology, 241
 burnt bone, 256–259
 of cremated bone, 259, **260–261**, 262, 262–264
 vertebrate, 254–256
 Holland, T. D., 4, 218, 256
 Hollard, C., 223
 homicide
 and drugs, 347–348
 rates, 346–347
 Horocholyn, K., 259, 263
 Hummel, S., 256
 Hypervariable region I (HVI), 215–216
- identification
 burning difficulties for, 134–135
 post-mortem, 59–60
 ignitable liquids, 29–30
 ignition and propagation phase, 351
 Imaizumi, K., 183, 215–216
 immolation homicide, 102, 108
 improvised explosive devices (IED), 383–385, 387, 388
 Incidence Command (IC), 375
 incineration, 148, 149–151
 incomplete cremation, 185, 257, 352
 inductively coupled plasma mass spectrometry (ICP-MS), 423, 426
 infrared analyses, 274, 275, 276
 interstitial lamellae, 253
 Intriago-Leiva, M., 6, 136
 inversion, 119, 170–171, 195–197, 229
 InViSorb Forensic Kit (InViTek), 214
 Ion Torrent platform (Thermo Fisher Scientific), 224

- irregular bones, 169, 171, 179–181,
179–182, 242
- irregular Haversian systems, 253, 265
- IsoArch, 285
- isotope analyses, 277–282
carbon and oxygen, 277–281, 279–280
strontium, 281–282
- Jarbo Gap Remote Automated Weather
Station, 373
- Kaur, N., 135
- K Compound, 385, 392, 394, 398
- Keyence VHX-2000 microscope, 180
- Kgatle, M. S., 137
- Koch, S., 174
- Kooi, R. J., 176
- Krogman, W. M., 1–2, 119
- Kutterer, A. U., 138
- L*a*b* color space, 233–236, 234
- Laboratory of Forensic Anthropology, 318,
320–321, 322, 360
- Lambert, J., 174
- lamellar bone, 195, 243, 250, 252–255
- lamellar matrix, 255
- laminar bone, 251–252, 263
- Lanting, J. N., 273, 276
- laser scanning, 295, 298
- laser time of flight, 298–299
- Lauwerier, R., 255
- Lentini, J. J., 42
- lifelike stance, 420, 426
- Locke, M., 251
- long bones, 17, 33–34, 82–84, 90, 94, 117, 118,
119, 127, 168–169, 171–172, 174, 242
- longitudinal fractures, 117
- Lopes, T., 349–350
- McDaniel, A., 233, 236
- Maciejewska, A., 205, 216
- McKinley, J., 5
- magnetic resonance imaging (MRI), 108,
140, 296–297
- manner of death (MOD), 53–54, 100, 346,
351
criminal immolation, 101–102
medicolegal determination of, 106–108,
107
self-immolation, 100–101
- Maples, W. R., 5
- Marciniak, S., 176
- Martiniaková, M., 255
- Mason, J. T., 179
- Massey, W., 4
- MDCT. *See* multidetector computer
tomography (MDCT)
- medicolegal classification methods,
78–79
- medicolegal determination, 105–108,
107
- mesenchymal osteoblast, 243
- methemoglobin (Met-Hb), 106
- metric methods, 139–140
- Meuse basin case, 283–285
- micro-CT scans, 4, 139, 178, 182–184,
293, 296, 297, 300, 302, 304, 307
- microwave oven death, 345–354, 346,
365–366
- midline structure, 125
- Mincer, H. H., 67
- MOD. *See* manner of death (MOD)
- molecular spectroscopy, 198
- Monteiro, C., 325
- Montenegro, J. B., 351–352
- Moore, S. E., 137
- morgue identification, 379–380
- Mori, R., 255
- morphological methods, 137–138
- Morris, Z. H., 266
- mtDNA, 205, 215–219, 223
- Mulhern, D. M., 255
- multidetector computer tomography
(MDCT), 222, 296, 302
- multi-slice computer tomography (MSCT),
108
- Munsell color reference, 232
- Munsell Soil Color Charts, 196, 421
- Murray, K. A., 4
- Mytum, H. C., 256
- nano-CT, 296
- National Fire Protection Association
(NFPA), 39, 42–43
- National Oceanic and Atmospheric
Administration (NOAA), 372
- Nelson, R. A., 257
- Netherlands case, 283–285
- neurocranium, 124
- neutron activation analysis (NAA), 183

- new classification system, 80–82
 Next Generation Sequencing (NGS)
 technologies, 223–225
 Nicholson, R. A., 258
 NIJ protocols, 43–51
 Noll, G. G., 351
 non-Haversian lamellar bone, 243
 non-recognizable, 353
 Nurbakhsh, S., 5
- Ohira, H., 219
 O’Leary, T. J., 179
 Operation Herrick, 383
 osteoblasts, 194–195, 243, 253
 osteoclasts, 194–195
 osteon banding, 254
 osteons, 195
 outdoor space fires, 29
 Owen, R., 222
- Pacific Gas & Electric (PG&E), 372–373
 Parkman-Webster murder case, 316, 319
 partial cremation, 352
 particle size effect, 276
 Passalacqua, N. V., 173–174
 pathological signs, 129
 patina fractures, 119
 PDCs. *See* pyroclastic density currents (PDCs)
 Pedrosa, M., 325
 Pfeiffer, S., 265
 photogrammetry, 295–296, 298, 300
 Piga, G., 6, 138
 Pitre, M. C., 258
 plexiform bone, 251
 Pointer, K., 259, 263
 polyproline II helix, 193
 Pompeii, 407–408, 410, 412, 416–417, 417, 419–420, 425–426, 428
 Poppa, P., 183
 porcelain laminate veneers (PLVs), 161
 Portuguese, 320–321, 327
 positive identification, 41, 148, 317, 353–354, 361, 365–366, 398, 401–402
 possibly recognizable, 352
 post-burning management, 323
 post-fire fragmentation, 31
 post-mortem (PM), 147, 154, 156, 156, 160, 165, 363
- examination, 13, 105, 108, 110, 136, 390, 401–402
 imaging, 108–110, 109
 post-mortem CT (PMCT), 109–110
 PowerPlex ESX 17 Fast Systems kit (Promega), 223
 PowerPlex Fusion Kit, 220
 PowerPlex Y23 System (Promega), 220
 prepacked scene equipment, 61, 61, **62**, 63
 preparation, post-mortem, 61
 Price, T. D., 138, 141
 primary bone tissue, 242–243, 250–252
 primary fracture, 169
 Primer-Extension Preamplification (PEP)
 method, 216
 pugilistic attitude, 416, 417, 426
 pugilistic pose, 116, 130, 170, 170, 301, 426
 pugilistic posture, 15, 16, 19, 21, 31, 48, 86, 88–89, 90, 94, 317
 pulp, 120–121, 125, 214
 puppet organs, 102
 pyroclastic density currents (PDCs), 408–409, 419
 pyroclastic flows, 409, 414–415, 427–428
- QIAamp DNA investigator kit, 222
 QIAamp DNA Mini Kit (Qiagen), 224
 Quatrehomme, G., 5
 Quinn, C. P., 4
- racemization, 202
 radial bone, 252
 radiocarbon dating, 273–274, 276–277, 278, 284
 radiographs, 295
 Raman spectroscopy, 200–201, **201**
 Ramlal, G., 218
 rapid DNA, 224–225, 380
 Raymond Baby’s model (1954), 76
 rear passenger space, 26
 recognizable for identification, 352–353
 reconstruction, 302–305
 recreational vehicle (RV), 80
 Red Flag Warning, 372
 reference collection, 316–318, 323, 325–326, 328
 reflectance transformation imaging (RTI), 299
 research potential, 324–327
 residential structure fires, 18, 22, 31, 39, 40, 44, 47, 49

- restorative procedures, 149–150, 152–153
reticular bone, 251, 254–256, 263
rib fragmentation and deformation,
125–126, 126
Ricci, U., 220
Richards, N. F., 2
Rodrigues, C. O., 4, 142, 325–326
Role 3 hospital, 385, 389, 394, 397–401
Rose, J. C., 4
Rothschild, M. A., 108
Royal Military Police (RMP), 383–385,
387, 392, 394–395, 395, 401–402
rubber tire combustion, 350–351
“Rule of Nines/Wallace Rule of Nines,”
78–79, 114–115
“Rule of Palms,” 79

Sacramento County Morgue, 378–379
sacrum, 126, 127
safety issues, 63–65, 64
Sajantila, A., 4
Samsuwan, J., 218
Sandholzer, M. A., 4
San Luis Obispo Fire Investigation Strike
Team training (SLOFIST) course, 80
saturation, 230
scanning electron microscope (SEM), 148,
153, 156, 159, 161, 165, 176–178,
182–184, 196–198, 295, 297–298,
301–302, 416, 429, 430
scanning electron microscope/energy
dispersive X-ray spectrometry (SEM/
EDX), 5, 178, 182–184, 196–198, 302
scene arrival, 63
scene evaluation, 65–66
Scheirs, S., 173–174, 183
Scheuer, L., 396
Schmidt, C. W., 6
Schuliar, Y., 135
Schultz, J. J., 5, 258
Schutkowski, H., 183, 256
Schwark, T., 215
secondary bone tissue, 252–254
secondary fractures, 169, 177, 181
secondary osteon, 253
second degree burns, 104, 114
self-immolation, 100–101, 108, 136
Senior Investigating Officer (SIO), 387
sex determination, 141–142

SFT. *See* sharp force trauma (SFT)
Shapiro, F., 251–252
Sharma, V., 224
sharp force trauma (SFT), 173–184,
180–181
shielding effect, 51–52, 52
Shipman, P., 3
short tandem repeat (STR), 205, 215–225
silica-based columns, 214
Simonit, F., 136
Singh, I. J., 256
single tooth recovery, 154
skeleton selection, 321, 322
skin, layers of, 115–116
Škvor Jernejčič, B., 141
small bone, 134, 380
smoldering phase, 351
Snoeck, C., 141
soft tissue alterations, 80, 115–116
Somma-Vesuvius volcanic complex, 408
Soto, G., 137
special circumstances, 51–54
special/dense Haversian systems. *See* dense
Haversian
Special Investigation Branch (SIB), 385
special lamellae, 253
Squires, K. E., 138
stabilizing materials, 69, 69
Staiti, N., 218
step fractures, 119
stereomicroscopic analysis (SM) tech-
nology, 176
Stewart, T. D., 3, 6, 141
StockMarks for Cattle Bovine Genotyping
Kit (Thermo Fisher Scientific), 221
Stonehenge, 273, 281–284, 282–284
strontium, 141, 274
strontium isotope ratios, 281–284
structured light scanning, 299
structure fire case, 18, 86, 86–90, 88, 92
structure from motion (SfM), 298
subcutaneous tissue, 115
suicide, 75, 100–101, 108, 136
suppression, 32, 32–33
surface lamellae, 253
Swegle, M., 256
Symes, S. A., 6, 55, 116–117, 119, 130,
174–175, 178
systematic search technique, 45–46

- TBS. *See* total body score (TBS)
 TBSA. *See* total body surface area (TBSA)
 technological progression, 292–293
 teeth, 60, 66, 67, 213–214, 217–219, 314–318
 alteration, 120–121, 121
 incineration, 148, 149–151
 signature findings, 125
 temperature exposures (100°C–1000°C), 205–208
 temporary mortuary, 383, 392–398, 394–396, 403
 Thavarajah, R., 179
 thermal alterations, 43, 51–52, 76, 79–81, 95, 170, 323, **342**, 343, 346, 352–353
 thermal damage, 13, 19, 26, 30–31, 80–81, 95, 114–115, 152–153, 158, 165, 167–168, 170–171, 174, 183–184
 thermal skull fractures, 108
 thermogravimetric analysis (TGA), 202
 third degree burns, 114
 Thompson, T. J. U., 5–6, 133, 140, 171, 257
 thorax structure, 125
 three-dimensional (3D)
 CAD modelling, 179–181, 179–182
 forensic science, 292
 imaging, 292, 295–299
 printing, 303–304
 surface scanning, 297–299
 visualization, 291, 306
 volumetric scanning, 296–297
 Thurman, M. D., 3
 time capsules, 413, 430
 tire combustion, 350–351
 Topoleski, J. J., 68, 140
 total body score (TBS), 83, 87, 96
 total body surface area (TBSA), 78–79
 trabecular bone, 33, 118, 119–120, 126, 168, 171, 173, 175, 195, 307, 375
 trachea, 106, 107
 transverse fractures, 117–118
 trauma signs, 129
 trench case, 90–91, 91–92
 trunk environment, 26–28, 27
 Tsuchimochi, T., 4
 two-dimensional (2D) imaging, 294–295
 Ubelaker, D. H., 6, 255, 323, 396
 University of Coimbra (UC), 320
 upper and lower limbs, 126–127
 van vark, G. N., 2
 Vassalo, A. R., 139
 vehicle fire case, 24–25, 83–85, 84–85
 Vermeij, E. J., 182–183
 vertebrae, 116, 126, 242
 vertebrate histology, 254–256
 Veselka, B., 326
 Vesuvius, 407–409, 417–418, 418, 420, 430
 victim, 69–71
 identification, 39, 147, 150, 152, 154, 160, 165, 220–221, 224
 violence
 in Brazil, 346
 defined, 347–348
 urban, 348
 viscerocranium, 124
 Volkmann's canals, 252
 Wai, K. T., 223–224
 Waltenberger, L., 183
 Warren, M. W., 5
 Warrior Six, 383, 401–402
 Warrior vehicle, 385, 386, 387–390, 388, 391, 392, 392, 394, 394, 395, 403
 Wegner, A., 136
 Wells, C., 2
 White, T. D., 396
 wildfires, 29, 136, 371–372, 374–375, 381
 Williams, H., 4
 Willmore, L. J., 3
 Wilson, D. F., 4
 WinHSL240, 196
 World Health Organization, 347
 World Trade Center disaster, 213, 292
 woven bone, 243
 Wu, J. Y., 251–252
 X-radiography, 295
 X-ray diffraction (XRD), 201–202
 X-ray fluorescence (XRF), 154–155, 156
 Yfiler Plus PCR Amplification kit, 223
 Y-STR profiles, 215, 220, 223
 Zana, M., 138
 Zephro, L., 174
 Zgonjanin, D., 220

