

# Index

## A

- Ambach, Walter, 480
- ANSI (American National Standards Institute), 15
- Asang, Ernst, 17, 151, 159, 182, 338
- ASTM (American Society for Testing and Materials), 6, 39
  - Committee F-8 on Sports Equipment and Facilities, 5
  - Committee F-27 on Snow Skiing, 5, 10-14
  - Method for Measuring the Release Moments of Adult Alpine Ski Bindings (F 504-77), 225, 227, 230

## B

- Bahniuk, Eugene, 5
- Balkfors, Bengt, 367, 375
- Bally, Alexis, 33
- Berre hail, Mohamed, 395
- BfU (Schweizerische Beratungsstelle für Unfallverhütung), 8, 33
- Binding(s)
  - Adjustment of
    - BfU method, 35, 203, 213
    - Deviation from reference systems, 321
    - Differences between IAS and BfU recommended values, 204-205
    - IAS method, 18, 46, 195, 203, 213
    - Tibia head method, 18, 46, 195

## Electronic bindings

- Accuracy, 256
- Adjustability, 256
- Biofeedback controller, 245
- Computer hardware, 262
- Computer software, 265
- Disadvantages, 257
- Dynamic system concept, 239
- Field test, 268
- First-order controller, 240
- Friction, 256
- Impulse-calculating controller, 242
- Mechanism, 268
- Model reference controller, 248
- Shock absorption, 255
- Forces (*see* Forces within bindings)
- Forward pressure spring, 231
- Functional testing, 35, 199-200, 213, 329, 341
- Inadvertent heel release, 227
- Mounting, 195, 216
- Release (*see* Release of bindings)
- Retention, 225, 239
- Binet, Marc-Hervé, 395
- Bodem, Friedrich, 45, 76
- Boot(s)
  - Design to prevent injury, 180
  - Effect on injury, 174-175
  - Force distribution, 171
  - Forward lean angle, 160-163
  - Height, 160, 182
  - Shaft, 159, 182

Stiffness, 155, 160, 173, 182  
Tongue forces, 172

Bowman, Warren D., Jr., 464

Boyle, John J., 411

Brady, M. Michael, 411

Brown, Christopher A., 224

Buló, José M., 141

## C

Calorimeter, continuous-flow, 481

Casel, Josef, 76

Collision

Binding function during, 77

Injuries, 358

Concussion, 378

Crane, Henry D., 382

Crombie, Nickel, 469

Cross-country skiing injuries

Ability of skier, 414, 419

Age of skier, 414, 428, 431

Compared with alpine skiing injuries, 423

Equipment relationship to, 414-417, 420

Location, 417, 427, 431

Mechanism, 417

Rates, 411-412, 414, 419

Severity, 428

Sex, effect on, 414, 428, 431

Ski instruction, effect on, 414, 419

Type, 417, 426, 430

## D

Danielsson, Katarina, 326

Death in skiing

Age of skier, 351

Cause, 353

Gender of skier, 352

Head injury, 353, 356, 379

Injury type, 353

Prevention, 356

Trunk injury, 353, 356

DIN (Deutsches Institut für Normung), 30

## E

Ekeland, Arne, 203, 293

Ekström, Hans, 433

Electromyography

During binding-release, 77, 84

Gastrocnemius force curve during binding release, 85

MREMG (mean rectified electromyogram signals), 56, 95

Engkvist, Ove, 367, 375

Ennemoser, Oswald, 480

Equipment, alpine (*see* Bindings, Books, Skis)

Equipment, cross-country

Bindings, 414-417, 439

Ski camber control, 436-437

Testing machines, 439-440

Eriksson, Ejnar, 326

Ettlinger, Carl F., 38, 224

## F

Falls, skiing

Analysis of forward fall, 87

Kinematics of, 77

Figueras, José M., 141

Flora, Gerhard, 480

Forces within bindings

At heel, 101, 104

At heel as predictor of tibial bending, 105

At toe, 99, 104

During skiing, 99

## G

Gutierrez, Maria D., 55

## H

- Hauser, Wolfhart, 27, 151, 159, 182, 338
- Head injury, 353, 356, 369, 375
- Heat packs, chemical, 480
- Hellquist, Einar, 367, 375
- Holm, Arild, 293
- Hubbard, Mont, 173
- Hull, Maury L., 238, 258
- Hulse, William F., 5
- Hypothermia
  - Afterdrop, core, 472
  - Cardiac arrest, 472, 476
  - Core temperature, 473
  - Diagnosis of, 465
  - Treatment of, 466-468, 474-477, 480
  - Ventricular fibrillation, 467, 472

## I

- IAS (Internationaler Arbeitskreis Sicherheit beim Skilauf), 8, 17
- IAS Specification 100, 21, 22
- Infrared thermal imaging
  - For crack test apparatus, 451
  - For impact testing, 455
  - In search and rescue, 457
  - Of skiers, 445-447
  - Of ski boots, 447
- Injury (*see also* specific injuries)
  - Ability of skier, effect of, 306, 321, 340, 362, 386
  - Age, effect of, 295, 307, 317, 340, 351, 361
  - Binding release, effect of, 389
  - During lessons, 307
  - Experience, effect of, 307
  - Location of, 294, 316, 353, 383, 385-386, 417, 427, 431
  - Mechanism (*see* Mechanism of injury)

- Rate, 38, 92, 174, 293, 295, 302, 315, 333, 338, 350, 383, 411-412
- Severity of, 360, 364, 428
- Sex, effect of, 295, 307, 317, 340, 351, 361, 385
- Speed, effect of, 263
- Total in United States, 305
- Type of, 145, 294, 316, 353, 369, 417, 426, 430
- While free skiing, 306
- ISO (International Organization for Standardization), 15
- Internal injury, 353, 356

## J

- Jenkins, Raeburn, 358
- Johnson, Robert J., 1, 110, 165, 358, 411, 489
- Jonsson, Ernst, 326

## K

- Knee injury, 145, 347
- Knee ligament surgery, 146
- Kuo, Chen Y., 55, 91

## L

- Lacerations, 309, 369, 376
- Lieu, Dennis K., 117
- Lind, Erik, 326
- Lindsjö, Ulf, 367, 375
- Lipe, Gordon, 9
- Llobet, Miguel, 141
- LMA (Laboratoire de Mécanique Appliquée), 33
- Louie, James K., 55, 91
- Lund, Øyvind, 203
- Lundkvist, Stig, 326
- Lyle, Carol, 173
- Lystad, Harald, 314

**M**

- MacGregor, Duncan, 258  
 Mechanism of injury, 296, 353, 359, 365, 369, 396  
 Medoff, Howard, 110, 165  
 Menke, Wolfgang, 45, 76  
 Merino, José A., 141  
 Models  
   Skier, 152  
   Ski/skier, 118  
   Ski/snow interaction, 123  
   Tibia (*see* Tibia, models)  
 Montillet, Bernhard, 395  
 Morgenstern, Rudolph, 141  
 Mote, C. Daniel, Jr., 1, 55, 91, 117, 489  
 Müller, Bernhard, 338  
 Muscle(s)  
   Forces, 157  
   Protection from injury, 57

**N**

- Nagel, Alfred, 191  
 National Board of Consumer Policies, Sweden, 327

**P**

- Pain  
   Boot-induced, 157, 160  
   Pressure-induced  
     Affective scale for, 112  
     At different foot and leg locations, 114  
     Foot pain sensitivity, 113  
     Maximum contact stresses, 114  
     Sensory scale for, 112  
 Pierce, Javin C., 165, 411  
 Pope, Malcolm, 110, 165, 358, 411  
 Pressure, boot-induced, 155, 160, 163  
 Pressure transducer, 183  
 Prevention of injury, 356, 365, 374

**R**

- Racers  
   Binding adjustment, 217  
   High release torques, 213  
   Injury rate, 295  
   Previous injury, 215  
 Release of bindings  
   Activity during, 68–70, 76, 83  
   Duration of, 83, 88–90  
   Forces during release, 80  
 Reuleaux, Michael, 191  
 Roberts, Charles C., Jr., 445  
 Rosen, James, 110

**S**

- Safety campaign in skiing, Sweden, 327  
   Cost-benefit analysis of, 334  
   Injuries before and after campaign, 331  
 Schaff, Peter, 159  
 Schattner, Ruprecht, 151, 182  
 Schild, Hans, 45  
 Shealy, Jasper E., 285, 302, 349, 423  
 Shoulder dislocation  
   Anatomical features of, 397  
   Associated lesions, 397  
   Mechanism of, 396  
   Prevention of, 406  
   Recurrent, 404  
   Sequelae, 406  
   Treatment of, 399–404  
 Ski brakes, 309  
 Ski(s)  
   Afterbody, 132, 137  
   Design of, alpine, 117  
   Modeled as Euler-Bernoulli beam, 118  
   Ski-turning mechanics, 117, 142–144  
     Carving, 118, 132–137  
     Skidding, 118, 133–137  
   Stiffness of, 137–139

Snow conditions, related to injury, 388  
 Snow depth, 361  
 Sport shop personnel  
     Standards, 192  
     Training, 191-202  
 Standards  
     Advantages of, 38-39  
     ASTM, definition of, 8  
     Failures of, 40-41  
     International, 14  
 Statistics in ski injury research  
     Case studies, 286  
     Clinical studies, 286  
     Epidemiological studies, 286  
     Experimental studies, 287  
     Misinterpretation of, 288-290  
     Risk exposure, 287

## T

T-bar ski lift injuries, 367, 379  
 Technique, cross-country skiing,  
     433-435  
 Terrenoir, Francois, 395  
 Thumb injury, 307, 390  
 Tibia  
     Boot top fracture, 173, 174  
     Models  
         One-dimensional beam, 176  
         Three-dimensional finite ele-  
         ment, 177  
         Two-dimensional beam, 178  
     Strength exceeded without injury,  
         93

Tibial head measurement  
     Computed tomography, 46  
     Gender parameter, 48, 53  
     Slide caliper rule, 46  
     Soft tissue compression (*see also*  
         Bindings, adjustment of),  
         48-49  
 Tissier, Bruno, 395  
 Torsion of lower extremity  
     At foot, 58, 62  
     During binding release, 68-69  
     During ski turning, 67  
     During snow skiing, 57, 66-70  
     Self-induced, 57, 62-65  
 Tree collision, 353, 365  
 TÜV (Technischer Überwachungs-  
     Verein) Bayern, 18, 27  
     Cooperation with IAS, 31  
     Organization of, 28

## V

Velho, Francisco, 182

## W

Wittman, Gerd, 23, 27

## Y

Young, Laurence R., 382