Conservation of Furniture
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Shayne Rivers
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## Contents

*Series editors’ preface*  xix  
*Contributors*  xxi  
*Acknowledgements*  xxv  
*Illustration acknowledgements*  xxvii  

### PART 1 HISTORY

1. **Furniture history** 3  
   1.1 Introduction 3  
   1.2 Earliest times to the Middle Ages 3  
      1.2.1 Egypt 3  
      1.2.2 Greece 4  
      1.2.3 Rome 5  
      1.2.4 Byzantium and the Romanesque period 5  
   1.3 Medieval 6  
      Background 6  
      Functional types 6  
      Design and construction 7  
      Materials used 8  
      Tools and techniques 8  
      Surface decoration and finish 8  
      Organization of the trade 9  
   1.4 Renaissance to Industrial Revolution 9  
      1.4.1 1500–1600 9  
         Background 9  
         Functional types 9  
         Design and construction 10  
         Materials used 11  
         Tools and techniques 11  
         Surface decoration and finish 11  
         Organization of the trade 12  
      1.4.2 1600–1700 12  
         Background 12  
   1.5 The nineteenth century 26  
      Background 26  
      Functional types 28  
      Style and type of construction 29  
      Materials used 30  
      Tools and techniques 31  
      Surface decoration and finish 33  
      Organization of trades and manufacturing 34  
   1.6 The twentieth century 35  
      Context 35  
      Materials used 35  
      Tools and techniques of conversion and construction 40  
      Surface decoration and finish 40  
      Organization of trades and manufacturing 41  

*Functional types* 13  
*Design and construction* 14  
*Materials used* 16  
*Trade practice, tools and techniques* 16  
*Surface decoration and finish* 18  
1.4.3 1700–1800 20  
*Background* 20  
*Functional types* 20  
*Design and construction* 21  
*Materials used* 23  
*Tools and techniques of conversion and construction* 24  
*Surface decoration and finish* 25  
*Organization of trades* 26  

*Organization of trades* 26  

*Trade practice, tools and techniques* 16  
*Surface decoration and finish* 18  
1.4.3 1700–1800 20  
*Background* 20  
*Functional types* 20  
*Design and construction* 21  
*Materials used* 23  
*Tools and techniques of conversion and construction* 24  
*Surface decoration and finish* 25  
*Organization of trades* 26  

1.5 The nineteenth century 26  
*Background* 26  
*Functional types* 28  
*Style and type of construction* 29  
*Materials used* 30  
*Tools and techniques* 31  
*Surface decoration and finish* 33  
*Organization of trades and manufacturing* 34  

1.6 The twentieth century 35  
*Context* 35  
*Materials used* 35  
*Tools and techniques of conversion and construction* 40  
*Surface decoration and finish* 40  
*Organization of trades and manufacturing* 41
## PART 2 MATERIALS

### 2 Wood and wooden structures

- **2.1 Introduction to wood as material**
- **2.2 The nature of wood:** appearance, cellular structure and identification
  - **2.2.1 Gross features**
    - Grain
    - Texture
    - Figure
    - Colour
    - **Taxonomy – the classification of plants**
  - **2.2.2 Wood anatomy: softwoods**
  - **2.2.3 Cell structure: hardwoods**
  - **2.2.4 Wood identification**
  - **2.2.5 Hand–lens examination**
  - **2.2.6 Microscopic examination**
  - **2.2.7 Other methods**
- **2.3 Chemical nature of wood**
  - **2.3.1 Chemical constituents of wood**
  - **2.3.2 The cellulose structure within cell walls**
- **2.4 Wood–water relations and movement**
  - **2.4.1 Hygroscopicity**
  - **2.4.2 Measuring moisture content of wood**
  - **2.4.3 Dimensional change**
  - **2.4.4 Estimating dimensional change**
- **2.5 Mechanical properties**
  - **2.5.1 Defining mechanical properties**
  - **2.5.2 Relative strength properties**
  - **2.5.3 Factors affecting the strength of wood**
  - **2.5.4 Role of wood strength in furniture**
- **2.6 Manufactured timber products**
  - **2.6.1 Veneers**
  - **2.6.2 Plywood and related materials**
  - **2.6.3 Reconstituted wood products**
- **2.7 Wooden structures**
  - **2.7.1 Types of joints**
  - **2.7.2 Critical success factors for joints**
  - **2.7.3 Dovetail joints**
  - **2.7.4 Mortise and tenon joints**
  - **2.7.5 Other joint types**

### 3 Upholstery materials and structures

- **3.1 Introduction to upholstery**
- **3.1.1 Classification and terminology**
- **3.1.2 Historical development**
- **3.1.3 Technical examination**
- **3.2 Top surface/simple structures**
  - **3.2.1 Leather/skin/parchment**
    - Skin
    - **Leather**
      - **Structure processing and properties**
      - **Methods of working and uses of leather**
      - Parchment
      - **Skins ‘in the hair’**
      - **Shark and ray skin**
      - **Identification of leather and skin products**
  - **3.2.2 Simple structures – interworked materials (including rush and cane)**
    - **Cordage**
    - **Rush**
    - **Wicker**
    - **Rattan or cane**
    - **Reed**
    - **Splints**
  - **3.2.3 Textiles**
    - **Fibres**
    - **Dyes and dyeing**
    - **Textile structures**
    - **Surface decoration and finishing**
    - **Identification of textiles and fibres**
  - **3.2.4 Synthetic polymers and plastics**
    - **Polystyrene**
    - **Polyester urethane and polyether urethane**
    - **Rubber**
    - **Identification of polymer systems**
3.2.5 Coated fabrics and ‘leather cloths’ 113
  Oil cloths 113
  Rubber cloths 113
  Cellulose nitrate 113
  Polyvinyl chloride (PVC) 113
3.2.6 Trimmings 113
3.3 Hardware 114
3.4 Under structures 115
  3.4.1 Fillings 116
    Animal materials 116
    Vegetable materials 118
    Elastomers, synthetic materials and latex 118
3.5 Support systems 119
  3.5.1 Webbing 119
  3.5.2 Springs 120
  3.5.3 Fabrics and twines used as part of the structure 120
3.6 Adhesives 120
Bibliography 121

4 Plastics and polymers, coatings and binding media, adhesives and consolidants 124
  4.1 Plastics and polymers 124
    4.1.1 Chemical structure 124
    4.1.2 Physical properties 126
    4.1.3 Polymer materials history and technology 128
    4.1.4 Identification of plastics and polymers 134
  4.2 Introduction to coatings, binding media, adhesives and consolidants 134
  4.3 Coatings – functions and properties 135
    4.3.1 Protection against handling and soiling 136
    4.3.2 Strength and elasticity 136
    4.3.3 Barrier properties 137
    4.3.4 Optical properties 138
    4.3.5 Solubility and working properties 140
  4.4 Coatings – structures and preparations 141
    4.4.1 Supports 142
      Stoppings 142
      Grain fillers 142
    4.4.2 Grounds 142
      Gesso grounds 142
      Bole 143
      Composition 144
  4.4.3 Paints and paint media 144
  4.4.4 Transparent coatings 146
    Historical use of varnishes 147
  4.4.5 Gilding 148
  4.4.6 Oriental lacquer (urushi) 149
    Preparing the lacquer 149
    Refining raw lacquer 150
    Making a cured film 150
    Applying lacquer to substrate 151
    Decoration 152
    Identification 152
  4.4.7 Japanning 153
  4.5 Adhesives 156
    Glue line thickness, adhesive failure 158
    Starved joints 159
    Roughening surfaces 159
  4.5.1 Factors governing the choice of an adhesive 159
    Health and safety 160
    Characteristics of cured adhesive 160
    Relativity of choice factors 160
  4.5.2 Adhesives used in woodworking 160
  4.5.3 Hot melt adhesives 161
  4.5.4 Contact cements 161
  4.6 Consolidants 161
  4.7 Review of materials: coatings, media, adhesives and consolidants 162
    4.7.1 Oils and fats 162
    4.7.2 Waxes 165
      Animal waxes 166
      Plant waxes 166
      Mineral waxes 166
      Commercial products 167
    4.7.3 Carbohydrates: sugars and polysaccharides 167
      Alginates 167
    4.7.4 Proteins 169
      Collagen 169
      Albumins 173
      Casein and milk 173
    4.7.5 Natural resins and lacquers 174
      Shellac 174
    4.7.6 Synthetic materials 179
      Thermoplastics 179
      Poly(vinyl acetate) PVAC 179
      Poly(vinyl alcohol) 180
      Poly(vinyl acetals) 180
      Acrylics 180
Cyclohexanone resins 181
Cellulose nitrates 182
Other thermoplastic materials 183
Thermosetting resins 184
Alkyds 185
Epoxies 185

4.8 Examination and identification of adhesives, coatings and media 187

Bibliography 189

5 Other materials and structures 194
5.1 Ivory, ivory-like teeth, bone and antler 194

Ivory 194
Bone and antler 197
Ivory substitutes 197
Identification of ivory, bone and antler 199

5.2 Keratinaceous materials – horn and turtle shell 201

General information 201
Turtle shell 201
Horn 202
Properties 202
Identification 203

5.3 Mollusc shell 204

5.4 Paper and paper products 205

Identification of paper and paper products 206

5.5 Metals 206

Iron and steel 208
Copper alloys 209
Common white metals 210
Gold leaf 210
Shell and powdered gold 211
Finishes and coatings on metals 211
Identification of metals 212
Identification of structure and fabrication of metal objects 212
Dating metals 213

5.6 Ceramics and glass 213

Flat glass 214
Identification of glass and ceramics 217

5.7 Stone and related materials 217

Marble 217
Identification of stone and related materials 218

5.8 Colorants: pigments, dyes and stains 219

5.8.1 Colour Why objects appear coloured 219

5.8.2 Pigments

Chemical properties 221
Physical properties 222

5.8.3 Dyes 230
5.8.4 Stains 230
5.8.5 Identification of pigments, dyes and stains 232

Bibliography 233

PART 3 DETERIORATION

6 General review of environment and deterioration 241
6.1 Introduction 241

6.1.1 Organizational and political context 241
6.1.2 Use versus preservation Change and damage 242
6.1.3 Managing the object life cycle 243

6.2 The environment 244
6.2.1 Background chemistry 244
6.2.2 Light 246

Light energy, colour temperature and damage 247
Reciprocity 248
Control of light 248
Lighting and heating 251

6.2.3 Heat 252

Measurement and control of temperature 252
6.2.4 Absolute humidity and relative humidity 253

Measuring RH 254
RH and damage 256
Control of RH 257

6.2.5 Pollution 260

Particulate pollution 260
Gaseous pollution 263

6.2.6 Biological agents 266

Fungi 266
Insects 267

6.2.7 Mechanical handling, packing and moving 273

Touch 273
Clothing 274

Forces applied to objects (lifting, moving and placing) 274
7 Deterioration of wood and wooden structures

7.1 Deterioration of wood as material
7.1.1 Natural defects in wood in living trees 285
7.1.2 Artificial defects – conversion and seasoning
Conversion 288
Seasoning defects 289
7.1.3 Deterioration of ‘normal’ seasoned wood
Light 290
Heat 291
Moisture 292
Pollution 294
Fungi 294
Insects 296
Mechanical deterioration of wood 301
7.2 Deterioration of wooden structures – causes
7.2.1 General – dimensional response of wooden structures 302
7.2.2 Faulty construction and conservation
Design faults 303
Faults in execution of the design 305
Poor quality materials used 306
Inappropriate use of material 306
Role of fashion and technical innovation 306
Conservation treatment errors 306
7.3 Deterioration of wooden structures – consequences 307
7.3.1 Broken and damaged parts and losses 307
7.3.2 Loose and lifting veneer 307
7.3.3 Loose and broken joints 308
7.3.4 Shrinkage, splitting and warping 308
7.3.5 Accretions and other surface disfigurement 310
7.3.6 Review of damage by structure 310
Carcase furniture 311
Tables 312
Bibliography 313

8 Deterioration of other materials and structures

8.1 Ivory, ivory-like teeth, bone and antler, horn and turtleshell 315
8.2 Mollusc shell – mother-of-pearl and related materials 316
8.3 Paper and paper products 317
8.4 Metals 317
Role of moisture 321
Chlorides 322
Light 322
Heat 322
Pollutants 322
Mechanical damage 323
8.5 Ceramics and glass 323
8.6 Stone and related materials 324
8.7 Colorants – pigments, dyes and stains 324
8.8 Plastics and polymers 326
Environmental stress cracking and crazing 327
Oxidation 327
The effect of light on polymers 328
The effect of heat on polymers 329
The effect of RH on polymers 329
The effect of pollution on polymers 329
Biological damage to polymers 330
Prevention and care 330
8.9 Coatings – deterioration of some common systems of surface decoration 331
8.9.1 The support 332
8.9.2 The ground
8.9.3 The paint
8.9.4 Transparent top coatings – varnishes
8.9.5 Gilding
8.9.6 Oriental lacquer
8.9.7 Japanning
8.10 Adhesives
8.11 Deterioration of specific materials
8.11.1 Oils and fats
8.11.2 Waxes
8.11.3 Carbohydrates: sugars and polysaccharides
8.11.4 Proteins
8.11.5 Natural resins and lacquers
8.11.6 Synthetic materials
8.12 Deterioration of upholstery materials and structures
8.12.1 Top surface/simple structures
8.12.2 Prevention conservation
8.12.3 Structural damage
8.12.4 Surface effects
8.13 Chemical degradation
8.14 Biodeterioration
8.15 Structure of textiles
8.16 Dyes and finishes
8.17 Preventive conservation of textiles
8.18 Plastics
8.19 Rubber
8.20 Polyurethanes
8.21 Polyvinyl chloride (PVC)
8.22 Cellulose nitrate
8.23 Trimmings
8.24 Understructures
8.25 Hardware

Bibliography

PART 4 CONSERVATION

9 Conservation preliminaries
9.1 Context
9.1.1 Historical background
9.1.2 Definition of the profession

9.1.3 Professional organizations
9.1.4 The business of conservation

9.2 Ethics
9.2.1 Codes of ethics and practice
9.2.2 Historical conflict between restoration and preservation
9.2.3 Conservation as a cultural discipline
9.2.4 Tools for balanced ethical judgement
9.2.5 The V&A ethics checklist

9.3 Examination
9.3.1 Purpose of examination
9.3.2 What to look for
9.3.3 Methods of examination
9.3.4 General aspects of characterization
9.3.5 Estimating
9.3.6 Gross examination
9.3.7 Simple mechanical tests
9.3.8 Microscopic examination
9.3.9 Sampling
9.3.10 General aspects of analytical methods
9.3.11 Dating methods

9.4 Documentation
9.4.1 What is documentation and why is it important?
9.4.2 Information needs
9.4.3 Documentation methods
9.4.4 Setting up a documentation system
9.4.5 Photography
9.4.6 The film
9.4.7 The light source
9.4.8 Alternative light sources
9.4.9 The camera

9.5 Studio organization and layout
9.5.1 Workshop processes and procedures
9.5.2 Examination and recording of condition
9.5.3 Dismantling the object
9.5.4 Repair of existing components and making of new ones
9.5.5 Re-assembly
9.5.6 Finishing and colouring
9.5.2 The location 409
9.5.3 The building/space 409
Entrance/loading bay 410
Client reception and administration area 410
Object storage 410
Examination and photography 411
The main work area 411
Machine room 411
Retouching area/clean room 412
The wood store 412
Upholstery workshop 412
Metalworking area 413
Recreational area 414
9.5.4 Detailed requirements 414
Storage 414
Wet areas 415
Electrical power supply 415
Lighting and heating 415
Extraction 416
9.6 Tools and equipment 417
9.6.1 Woodworking tools and equipment 417
9.6.2 Other tools and equipment 418
9.7 Health and safety 420
9.7.1 Health and safety requirements 421
Principal legal requirements 421
What you should know about health and safety law 421
9.7.2 The process of managing health and safety 422
9.7.3 Documentation for health and safety management 422
9.7.4 Risk assessment 423
Generic assessments 424
Five steps to risk assessment 424
Step 1: Look for the hazards 424
Step 2: Decide who or what might be harmed and how 426
Step 3: Evaluate the risks 426
Step 4: Record your findings 427
9.7.5 Control risk 427
The hierarchy of control 428
The life cycle of control 428
9.7.6 Maintain controls 428
9.7.7 Monitor exposure 429
9.7.8 Survey health 429
9.7.9 Inspect the workplace 429
Checklist for health and safety review 430
9.7.10 Inform, instruct and train 430
Shared workplace and visiting workers 430
Duties of employees 430
Labelling and signage 430
9.7.11 Audit 430
9.7.12 Accidents and emergencies 430
Fire prevention 431
Fire precautions 431
9.7.13 Further information on health and safety 431
Bibliography 432
10 Principles of conserving and repairing wooden furniture 436
10.1 General principles 437
10.1.1 Diagnosing the cause of failure 437
10.1.2 Selection of repair method and repair material 438
10.1.3 Selection of wood for a repair 438
10.1.4 Transferring shapes, profiles and measurements 439
10.1.5 Making the repair piece 439
10.1.6 Fitting the repair to the object 439
10.1.7 Adhesion and surface preparation 440
10.1.8 Selecting an adhesive 442
10.1.9 Assembly 444
10.1.10 Cramping/clamping 444
10.1.11 Levelling repairs 448
10.1.12 Preparation of repair for finishing 449
10.2 General techniques 454
10.2.1 Dismantling furniture 454
10.2.2 Cleaning joints after dismantling 458
10.2.3 Repairs after insect infestation 458
xii  Contents

10.2.4 Reinforcing joints 459
10.2.5 Frames 459

Handling mirror frames 459

10.3 Repair by damage type 460
10.3.1 Loose and broken joints 460
10.3.2 Shrinkage checks and splits 461
10.3.3 Hinges 465
10.3.4 Warping 465
10.3.5 Breaks and losses 468
10.3.6 Faulty construction 470

10.4 Veneer, marquetry and boulle 470
10.4.1 Laying veneer 471
10.4.2 Cleaning 473
10.4.3 Consolidation 474
10.4.4 Transferring the outline of a loss 476
10.4.5 Replacing losses 476
10.4.6 Lifting original veneer 480
10.4.7 Coatings for boulle work 481
10.4.8 Stringing and metal inlay 481

10.5 Moulding and casting 482
10.5.1 General procedure 482
10.5.2 Selection of materials 483
10.5.3 Release agents 488
10.5.4 Making a mould 489
10.5.5 Colorants and fillers 489
10.5.6 Finishing 489
10.5.7 Gilders composition 490

Ingredients 490
Mixing 490

Bibliography 491

11 Principles of cleaning 494
11.1 Preliminaries 495
11.1.1 Cleaning objectives 495
11.1.2 Examination 496
11.1.3 Pre-cleaning checklist 496
11.1.4 General approach 496
11.1.5 Cleaning tests 497
11.1.6 Dirt 499
11.1.7 Removal of varnish or overpaint 500

11.2 Mechanical cleaning 501
11.2.1 Dusting 501
11.2.2 Cleaving 501
11.2.3 Abrasives 503
11.2.4 Dry cleaning methods 503

11.3 Solvent cleaning 504
11.3.1 Classes of solvents that may be encountered in

furniture conservation 505
Hydrocarbon solvents 505
Chlorinated hydrocarbons 509
Alcohols 510
Aldehydes and ketones 510
Ethers 511
Esters 511
Organic nitrogenous compounds 511

11.3.2 Physical properties of solvents 512
Evaporation rates, vapour pressure and density 513
Viscosity 513
Surface tension and capillary action 514
Toxicity 514
Flammability 515

11.3.3 Solubility 515
Process of dissolution 515
Solubility parameters 518
Predicting solubility 518
Solvent removal of varnish 524
Mixing solvents 525

11.3.4 Proprietary paint strippers 526

11.4 Chemical cleaning 527
11.4.1 Introduction to acids and bases 527
11.4.2 Ka and pKa 528
11.4.3 Acids 529
11.4.4 Bases 529

11.5 Aqueous cleaning 529
11.5.1 pH and aqueous cleaning 531
11.5.2 pH buffers 532
Choosing a buffer 532

11.5.3 Ionic concentration/conductivity 533

11.5.4 Soaps, detergents and surfactants 534
Detergents 535
Emulsions and hydrophilic lipophilic balance (HLB) numbers 535
Critical micelle concentration (CMC) 536
Choosing a detergent residues and rinse procedures 540

11.5.5 Chelating agents 540
Formation constants 542
Effects of pH and conditional stability constants 543
11.5.6 Enzymes 548
11.5.7 Blanching and blooming 551
11.6 Thickened solvent delivery systems – pastes, poultices and gels 552
11.6.1 Controlled vapour delivery 553
11.6.2 Gelling materials 553
  - Clays 553
  - Cellulose ethers 554
  - Polyacrylic acid (Carbopol) 556

Bibliography 557

12 Principles of consolidation, aesthetic reintegration and coatings 560
12.1 Basic principles 560
  12.1.1 Making solutions 561
    - Concentration 561
    - Molar solutions 561
    - Dilution 561
    - Measuring small quantities without a balance 562
12.2 Consolidation 562
  12.2.1 Introduction to consolidation treatment 562
  12.2.2 Penetration of consolidant and reverse migration 563
12.2.3 Consolidation of wood 563
  - Materials used to consolidate wood 564
12.2.4 Consolidation of painted and decorated surfaces 566
  - Traditional vs. modern materials 567
  - Materials used for the consolidation of decorative surfaces 567
  - Application techniques 571
    - Flakes, cups, tents and blisters 572
    - Facing 573
12.3 Aesthetic reintegration 574
  12.3.1 Fills 574
    - Introduction to filling 574
    - Fill materials 576
12.3.2 Retouching 578
  - Introduction to retouching 578
  - Light, colour and metamerism 579
  - Materials for retouching 582

Making paint tablets 585
Commercial preparations 586

12.4 Coatings 586
  12.4.1 Introduction to coating 586
  12.4.2 Saturation and gloss 587
    - Refractive index 588
    - Gloss 589
    - Molecular weight 589
  12.4.3 Varnish formulation 589
  12.4.4 Matting down varnishes 590
  12.4.5 Stabilizers 592
  12.4.6 Selecting a coating 593
  12.4.7 Coating materials 593
    - Natural resins 593
    - Acrylics 594
    - Synthetic low molecular weight varnishes 595
  12.4.8 Application methods for coatings 598
    - Brush application 598
    - Spray application 598

Bibliography 602

13 Conserving transparent coatings on wood 606
13.1 Introduction to transparent finishes 606
  13.1.1 Photochemical oxidation and patina 607
  13.1.2 Revivers 607
13.2 Cleaning 608
13.3 Selective layer removal 610
13.4 Surface blemishes 611
  13.4.1 Dents and scratches 611
  13.4.2 Watermarks 611
  13.4.3 In-filling varnish losses 612
13.5 Colour matching repairs to varnished wood 612
  13.5.1 Introduction to colour matching processes 612
  13.5.2 Surface preparation 613
  13.5.3 Materials for colour matching wood repairs 614
    - Precautionary measures 614
    - Bleaches 614
    - Addition of colour to wood repairs: pigments, lakes and stains 616
  13.5.4 Grain fillers 620
  13.5.5 Stoppings and filling materials 622
  13.5.6 Colour matching methods 624
Bibliography 623
### 13.6 Treatment of degraded varnish

627

13.7 Application of coatings to varnished wood

628
- 13.7.1 Non-traditional materials

628
- 13.7.2 Traditional materials

629
  - Wax

629
  - Oils

630
  - Natural resins

631
  - French polishing

633
  - Glazing

637

13.8 Craquelure, crazing and crocodiling

637

13.9 Polishing or dulling a varnished surface

638

13.10 Distressing

639

Bibliography

639

### 14 Introduction to traditional gilding

642

14.1 Background

642
- 14.1.1 Water and oil gilding

642
- 14.1.2 Tools for gilding

643
- 14.1.3 Gold and metal leaf

646
- 14.1.4 Surface preparation

647
- 14.1.5 Gesso putty

647

14.2 Water gilding

647
- 14.2.1 Conditions for gilding

647
- 14.2.2 Size

648
- 14.2.3 Preparation of glue size

648
- 14.2.4 Assessing gel strength

648
- 14.2.5 Sizing the wood

649
- 14.2.6 Gesso

649
- 14.2.7 Application of gesso

650
- 14.2.8 Faults in the gesso

652
- 14.2.9 Smoothing the gesso

652
- 14.2.10 Decorative details

653
- 14.2.11 Recutting

653
- 14.2.12 Yellow ochre

655
- 14.2.13 Bole

655
- 14.2.14 Laying the leaf

658
- 14.2.15 Faulting

660
- 14.2.16 Matte water gilding

660
- 14.2.17 Double gilding

661
- 14.2.18 Burnishing

661
- 14.2.19 Punched decoration

662
- 14.2.20 Coatings

662

14.3 Oil gilding

663
- 14.3.1 Mordants for oil gilding

663
- 14.3.2 Surface preparation

664
- 14.3.3 Applying the oil size

664
- 14.3.4 Applying gold leaf

664
- 14.3.5 Coatings

665

14.4 Composition

665

Bibliography

666

### 15 Conserving other materials I

667

15.1 Ivory, bone and antler, turtleshell and horn, mother-of-pearl

667
- 15.1.1 Ivory, bone and antler

667
  - Cleaning

667
  - Staining

668
  - Consolidation

669
  - Humidification

669
  - Adhesives

669
  - Replacements

670
  - Staining ivory

670
  - Polychrome ivory

670
  - Coatings

671
  - Antler

671
  - Repair and replacement

671

15.2 Paper labels and linings on furniture

674
- 15.2.1 Labels

675
  - Options for dealing with a label on furniture

675

15.2.2 Paper liners

676

15.3 Metals

677
- 15.3.1 Introduction

677
  - Patina

678
  - Removal of metal fittings

678

15.3.2 Cleaning

678
- 15.3.3 Removal of corrosion products

679
  - Mechanical removal of corrosion products

680
  - Electrochemical and electrolytic reduction

681
  - Chemical removal of corrosion products

682
- 15.3.4 Rinsing and drying

682
15.3.5 Repairs 683
15.3.6 Replacement elements 683
15.3.7 Application of coatings after conservation 684
Method of application 685
Preferential corrosion 685
Coating materials for metals 686
15.3.8 Ferrous metals 688
Patination of iron 688
Mechanical removal of corrosion products 689
Rust converters 690
Chemical removal of corrosion products 691
Coatings 692
15.3.9 Brass and bronze 692
Stabilization 692
Mechanical removal of corrosion products 693
Chemical removal of corrosion products 693
Stress corrosion cracking 693
Dezincification and the deposition of insoluble metal complexes 694
Reagents for the chemical removal of corrosion products 694
15.3.10 Ormolu 696
Cleaning 697
Removal of corrosion products 697
15.3.11 Silver 698
Removal of corrosion products 699
Reshaping 700
Prevention of tarnish 700
Coatings 700
15.3.12 Lead 700
Removal of corrosion products 701
Coatings 701
15.4 Ceramics and enamels 701
15.4.1 Cleaning 702
15.4.2 Bonding 702
15.4.3 Filling losses 703
15.4.4 Retouching 703
15.4.5 Enamels 704
15.5 Flat glass, mirrors, reverse painted and gilded glass 705
15.5.1 Flat glass 705
15.5.2 Mirrored glass 705
15.5.3 Painted and decorated glass 706
15.5.4 Repairs to adjacent wood 707
15.5.5 Removing glass 707
15.5.6 Refitting decorated and mirrored glass 708
15.5.7 Cleaning undecorated glass 708
15.5.8 Cleaning mirrored and decorated glass 709
15.5.9 Repair of glass 709
15.5.10 Consolidation 709
15.5.11 Restoration and retouching 710
15.5.12 Coatings 710
Bibliography 710

16 Consering other materials II 714
16.1 Stone and related materials 714
16.1.1 Marble 714
Cleaning 714
Consolidation 716
Repair and reintegration 716
Coatings 717
16.1.2 Scagliola 717
Cleaning 717
Consolidation 717
Fills 718
Coatings 718
16.1.3 Piètre dure 718
Cleaning 718
Fills/losses 718
Coatings 718
16.2 Plastics 719
16.2.1 Introduction to plastics 719
16.2.2 Cleaning 719
16.2.3 Adhesives and consolidation 720
16.2.4 Filling 721
16.2.5 Retouching 721
16.2.6 Coatings 721
16.3 Upholstery 721
16.3.1 Introduction to upholstery conservation 721
16.3.2 Ethics 722
16.3.3 Examination and documentation of upholstery 723
16.3.4 Previous interventions 723
16.3.5 Condition of the frame 724
16.3.6 Materials 724
16.3.7 Non-invasive treatments 725
Surface cleaning 725
Semi-transparent coverings 725
Case covers 726
Stabilizing with repairs 726
Supports 726
16.3.8 Invasive treatments 726
Removal and documentation 726
Metal fixings 727
Cleaning 727
Supports 728
Reapplication of lined textiles 729
Storage for study as an alternative to reapplication 729
Independent sub-frames 729
16.3.9 Rush, reed and cane 729
Rehumidification 729
Deacidification 730
Repair 730
16.3.10 Imitation leather 730
16.4 Leather, parchment and shagreen 731
16.4.1 Leather 731
Evaluating the surface of the leather 731
Cleaning 732
Chemical stabilization 732
Consolidation 733
Inills 734
Backing materials 736
Coatings 736
16.4.2 Parchment and vellum 736
Cleaning 737
Repair and support 738
Coatings 739
16.4.3 Shagreen 739
Cleaning 740
Lifting edges and tears 740
16.5 Textiles 740
16.5.1 Cleaning 742
16.5.2 Loose and lifting linings 742
16.6 Painted furniture 743
16.6.1 Introduction to conservation of painted furniture 743
16.6.2 Cleaning 744
16.6.3 Removal of varnish 745
Mechanical removal 747
Solvents 747
Alkaline reagents 749
Aqueous methods 749
Removal of synthetic varnishes 751
16.6.4 Removal of overpaint 751
16.6.5 Consolidation 752
16.6.6 Reintegration 752
16.6.7 Coatings 752
16.6.8 Matte paint 753
16.7 Japanned furniture 753
16.7.1 Introduction to japanning 753
16.7.2 Examination of objects 754
16.7.3 Cleaning 755
16.7.4 Removal of overpaint and later varnishes 757
16.7.5 Consolidation 757
16.7.6 Infilling 758
Fills for grounds 758
Fills for papier mache 759
Fills for japanned layers 759
16.7.7 Varnishes 759
16.8 Lacquered (urushi) furniture 760
16.8.1 Introduction and definition 760
16.8.2 Handling lacquer 760
16.8.3 Distinguishing Oriental lacquer from japanning 761
16.8.4 Eastern and Western approaches to restoration and conservation 762
16.8.5 Cleaning 763
Potential problems 763
Removal of surface dirt and accretions 763
Cleaning decorative elements 764
Removing unwanted coatings 764
16.8.6 Consolidation 766
Softening brittle lacquer before consolidation 766
Flattening distorted lacquer 767
Materials 767
Shell inlay 768
16.8.7 Infilling 768
16.8.8 Retouching 768
16.8.9 Restoring a degraded matte surface 769
16.8.10 Coatings 769
16.9 Gilded furniture 770
16.9.1 Introduction to conservation of gilded surfaces 770
| 16.9.2 | General care | 771 |
| 16.9.3 | Cleaning | 771 |
| 16.9.4 | Removal of overgilding | 773 |
| 16.9.5 | Removal of bronze paint | 773 |
| 16.9.6 | Consolidation | 773 |
| 16.9.7 | Reintegration | 774 |
| 16.9.8 | Composition | 776 |
| 16.9.9 | Coatings | 776 |
| 16.9.10 | Distressing | 776 |
| 16.9.11 | Toning | 777 |
| Bibliography | | 777 |
| Index | | 785 |
The conservation of artefacts and buildings has a long history, but the positive emergence of conservation as a profession can be said to date from the foundation of the International Institute for the Conservation of Museum Objects (IIC) in 1950 (the last two words of the title being later changed to Historic and Artistic Works) and the appearance soon after in 1952 of its journal *Studies in Conservation*. The role of the conservator as distinct from those of the restorer and the scientist had been emerging during the 1930s with a focal point in the Fogg Art Museum, Harvard University, which published the precursor to *Studies in Conservation, Technical Studies in the Field of the Fine Arts* (1932–42).

UNESCO, through its Cultural Heritage Division and its publications, had always taken a positive role in conservation and the foundation, under its auspices, of the International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM), in Rome, was a further advance. The Centre was established in 1959 with the aims of advising internationally on conservation problems, co-ordinating conservation activators and establishing standards of training courses.

A significant confirmation of professional progress was the transformation at New York in 1966 of the two committees of the International Council of Museums (ICOM), one curatorial on the Care of Paintings (founded in 1949) and the other mainly scientific (founded in the mid-1950s), into the ICOM Committee for Conservation.

Following the Second International Congress of Architects in Venice in 1964 when the Venice Charter was promulgated, the International Council of Monuments and Sites (ICOMOS) was set up in 1965 to deal with archaeological, architectural and town planning questions, to schedule monuments and sites and to monitor relevant legislation. From the early 1960s onwards, international congresses (and the literature emerging from them) held by IIC, ICOM, ICOMOS and ICCROM not only advanced the subject in its various technical specializations but also emphasized the cohesion of conservators and their subject as an interdisciplinary profession.

The use of the term *Conservation* in the title of this series refers to the whole subject of the care and treatment of valuable artefacts, both movable and immovable, but within the discipline conservation has a meaning which is distinct from that of restoration. *Conservation* used in this specialized sense has two aspects: first, the control of the environment to minimize the decay of artefacts and materials; and, second, their treatment to arrest decay and to stabilize them where possible against further deterioration. Restoration is the continuation of the latter process, when conservation treatment is thought to be insufficient, to the extent of reinstating an object, without falsification, to a condition in which it can be exhibited.

In the field of conservation conflicts of values on aesthetic, historical, or technical grounds are often inevitable. Rival attitudes and methods inevitably arise in a subject which is still developing and at the core of these differences there is often a deficiency of technical knowledge. That is one of the principal *raisons d’être* of this series. In most of these matters ethical principles are the subject of much discussion, and generalizations cannot easily cover (say) buildings, furniture, easel paintings and waterlogged wooden objects.

A rigid, universally agreed principle is that all treatment should be adequately documented.
There is also general agreement that structural and decorative falsification should be avoided. In addition there are three other principles which, unless there are overriding objections, it is generally agreed should be followed.

The first is the principle of the reversibility of processes, which states that a treatment should normally be such that the artefact can, if desired, be returned to its pre-treatment condition even after a long lapse of time. This principle is impossible to apply in some cases, for example where the survival of an artefact may depend upon an irreversible process. The second, intrinsic to the whole subject, is that as far as possible decayed parts of an artefact should be conserved and not replaced. The third is that the consequences of the ageing of the original materials (for example 'patina') should not normally be disguised or removed. This includes a secondary proviso that later accretions should not be retained under the false guise of natural patina.

The authors of the volumes in this series give their views on these matters, where relevant, with reference to the types of material within their scope. They take into account the differences in approach to artefacts of essentially artistic significance and to those in which the interest is primarily historical, archaeological or scientific.

The volumes are unified by a systematic and balanced presentation of theoretical and practical material with, where necessary, an objective comparison of different methods and approaches. A balance has also been maintained between the fine (and decorative) arts, archaeology and architecture in those cases where the respective branches of the subject have common ground, for example in the treatment of stone and glass and in the control of the museum environment. Since the publication of the first volume it has been decided to include within the series related monographs and technical studies. To reflect this enlargement of its scope the series has been renamed the Butterworth-Heinemann Series in Conservation and Museology.

Though necessarily different in details of organization and treatment (to fit the particular requirements of the subject) each volume has the same general standard, which is that of such training courses as those of the University of London Institute of Archaeology, the Victoria and Albert Museum, the Conservation Center, New York University, the Institute of Advanced Architectural Studies, York, and ICCROM.

The authors have been chosen from among the acknowledged experts in each field, but as a result of the wide areas of knowledge and technique covered even by the specialized volumes in this series, in many instances multi-authorship has been necessary.

With the existence of IIC, ICOM, ICOMOS and ICCROM, the principles and practice of conservation have become as internationalized as the problems. The collaboration of Consultant Editors will help to ensure that the practices discussed in this series will be applicable throughout the world.
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    reintegration and coatings
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13 Conserving transparent coatings on
    wood
    Shayne Rivers, Gregory Landrey and
    Nick Umney

14 Introduction to traditional gilding
    Susan May, Brian Considine and
    Shayne Rivers

15 Conserving other materials I
15.1 Ivory, bone and antler, turtleshell and
    horn, mother-of-pearl
    Frank Minney, Shayne Rivers and
    Jonathan Thornton
15.2 Paper labels and linings on furniture
    Jodie Lee Utter and Shayne Rivers
15.3 Metals
    Francis Brodie, Shayne Rivers and
    Jonathan Thornton
15.4 Ceramics and enamels
    Fi Jordan and Shayne Rivers
15.5 Flat glass, mirrors, reverse painted and
    gilded glass
    Patricia R. Jackson and Shayne Rivers
16 Other materials II
16.1 Stone and related materials
   Charlotte Hubbard and Shayne Rivers
16.2 Plastics
   Brenda Keneghan and Shayne Rivers
16.3 Upholstery
   Sherry Doyal and Kathryn Gill
16.4 Leather
   Timothy Hayes and Shayne Rivers
16.4 Parchment and shagreen
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**Figure 2.27** Drawing by Liz Wray

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Part 1

History
1

Furniture history

1.1 Introduction

The importance of furniture as an indicator of the way people live has been recognized by many social historians as well as those interested solely in furniture. This recognition has led to a distinction between historians of antiques and decorative arts, and those who take a ‘material culture’ approach. The latter examine furniture as part of an effort to understand the society that made and used it. The analysis of furniture is often the same for both groups: it is the emphasis put on the results that varies along with the types of furniture examined.

Locating furniture types and their usage within the society that produced them will help to reveal the social structure, wealth and intellectual values that society had. In addition to this, the historical events and circumstances which influenced art and design, the economic, political, religious and intellectual climate had an effect on the way furniture was designed, made and used. All these strands help in explaining how ideas about function, comfort, style and use of materials are manifested in furniture. The production and use of furniture were also dependent on the materials and technology available to the makers. Therefore, to gain a fuller understanding, one also needs to investigate the construction, quality of workmanship and available tools.

Each subsequent section is therefore planned so that a brief historical context is followed by an analysis of functional types and the development of particular forms of furniture. This is supplemented by a discussion of stylistic features and constructional elements. Materials used in the process of making are then discussed, followed by an evaluation of the tools and techniques used in construction, from the conversion of timber to the final finish. The sections conclude with a brief discussion of the organization of the trade and the role of the craftsman.

This account is necessarily focused predominantly on England, America and France, but a similar approach can be applied to other traditions. We apologize to all colleagues for whom this is not the most relevant axis. We hope, however, that the approach taken together with the reference points provided in the text and bibliography will still be helpful in illuminating the range of materials, structures and techniques encountered by the furniture conservator. Some further discourse of the history of technology will be found in Part 2 with reference to upholstery and other non-wood materials.

1.2 Earliest times to the Middle Ages

1.2.1 Egypt

The earliest evidence of true furniture is found in the Egyptian society that existed some five thousand years ago. The exceptional circumstances of survival in royal tombs have given us famous examples of furniture. It is apparent that beds, chairs, stools, tables and storage boxes had all been created by 3000 BC, and there is no doubt that a skilled workforce existed in Egypt.

Beds were developed from crude frames lashed together, to sophisticated jointed frames and proper suspensions of leather thongs. They were supported on short legs, usually in the form of a bull’s foot. Beds were often supplied with a separate head-rest, as headboards were unknown.
Seats were derived from backless stools, initially having framed seats with carved bull’s legs to the front, and then developing to armchairs by the fourth dynasty (c.2600–2500 BC). The most well-known example of an Egyptian seat is Tutankhamun’s gold throne, both as a model of furniture-making and also as the embodiment of the symbolic authority of the chair (Figure 1.1). On a more mundane level, stools remained popular, often designed with braced struts and a white paint finish. Folding stools were also used: they often had hide seats, and cross-frames decorated as carved duck’s heads inlaid with calcite, faience and coloured glass.

Tables were usually small, hardly more than stands for food or offerings. Gaming boards were mounted onto legged frames to create the earliest example of games tables. Most boxes, whether of wood, papyrus or reed, were rectangular with short feet. Some were fitted with divisions for toiletries, jewellery and the like.

The selection of materials began in the locality and was extended to other sources. The only local timbers – acacia, sycamore, fig and tamarisk – were supplemented by imported woods, such as cedar, cypress ebony, juniper and thuya. The shortage of timbers resulted either in the use of veneer or a build up of smaller pieces of wood. In other cases, furniture was occasionally overlaid with gold or silver or made from solid ivory.

The construction of cabinets was based on the mortise and tenon, dovetail and mitred joints. Hinges were used from the eighteenth dynasty (1575–1300 BC) as a replacement for wooden pivots in chests, but locks were rare.

Woodworking tools included mallets, saws with copper or bronze blades, axes and drills. For levelling timber, adzes were used since the woodworking plane was not invented until later. This is perhaps one reason why the Egyptians ground the timber surface with sand and overlaid it with gesso, ready for gilding or painting. In some cases a transparent varnish was used.

The origins of the techniques of wood-turning and bending have been the subject of some dispute amongst experts. It is probable that whilst bending was known in Egypt, the lathe originated in Syria (c.1000 BC) and was not known to the Egyptians. However, the establishment of many type-forms, tools and techniques originated from this time.

1.2.2 Greece

Very few pieces of Greek furniture survive, so the main sources are the illustrations on pottery and a few remaining stone-carved items. Nevertheless, there is enough evidence to identify the main furniture types. It is not surprising that the main categories resembled Egyptian prototypes but there were other developments that had a long-lasting influence.

The most important of these was the introduction of the couch as a development of the Egyptian bed. It was used not only as a bed but also as a sofa for reclining upon. This developed stylistically into the Greek sofa with its well-known curved head and footboards.

Seating arrangements were based on a range of stools and chair types. Stools were basic four-legged versions or box-like constructions. In addition there was the diphros, a four-legged stool with stretchers. The famous
klismos chair form (Figure 1.2), originally with well-proportioned outward-curving legs and a back panel at shoulder height, gradually developed a top-heavy back board, thus making it rather clumsy in appearance.

The use of chests is evident but no such item as a cupboard was made, as most items were hung on the wall. Low tables were used for dining purposes, then subsequently removed.

Due to the plentiful supply of timber, the Greeks avoided the need for veneers and it was only in Roman times that the art returned. However, materials such as marble, bronze, inlaid ivory and precious stones were used to decorate important pieces of furniture, often in conjunction with wood.

Etruscan furniture often relied on Greek models. The main Etruscan contribution to furniture-making was the use of bronze for tripods, candelabra and a particular circular casket called a cista. They also produced a chair type which was based on a barrel shape, having a back made in either wood or sheet bronze, curving round to form arms.

1.2.3 Rome

The continuation of Greek ideals, through the spread of Roman civilization around the Mediterranean, ensured that furniture of Graeco-Roman style was used all over the Empire. For example, straight-legged folding stools have been found in Belgium and England, cross-legged stools in Holland, and a remarkable silver tripod-table in Germany. Greek forms naturally continued, with couches and klismos chairs being the most popular. Some Roman chairs were based on an upright panelled chair and there are instances of tub-shaped chairs being made from wicker.

Tables were small and round, often made in bronze or silver, with three or four legs in the shape of animal legs. Storage furniture was still mainly in the form of chests, but later came the idea of a cupboard with doors and shelves.

The Romans used a great variety of materials which included imported veneers and highly prized woods, bronze, marble, silver and materials peculiar to a specific region.

The invention of the plane, arguably the most important advance in woodworking, seems to have occurred in Roman times, as no evidence has been found of its use previously. The manufacture of furniture was aided by the development of the plane which removed a continuous shaving rather than a chip, and so allowed not only shaping, but also close fitting of parts and a smooth finish.

1.2.4 Byzantium and the Romanesque period

The collapse of the Roman Empire in the fifth century AD moved the centre of culture to Byzantium. The Byzantine aesthetic was based on an amalgam of a new Christian tradition, mixed with Hellenistic taste and an oriental interest in rigid abstract ornamentation. In addition to this stylistic mix was the continuity of the cabinet-making tradition which resulted in the survival of the skilled craft.

Chairs and thrones remained important and were now based on a box shape with a back. X-framed chairs, often made of metal, were typically fitted with a slung leather seat. Combinations of desk and lectern were significant, indicating the importance of manuscripts and reading. Tables followed classical models, sometimes with drawers and lecterns, in a variety of shapes including circular. Chests were important and the open cupboard was fairly
common. Some beds were magnificent structures with high canopies and curtains.

The skill of Byzantine woodworkers was demonstrated by their use of the lathe. They also used the panelled construction process to avoid the cracking of ivory panels due to shrinkage. As in other parts of the Mediterranean, limited amounts of wood meant that stone, metal and other materials were also used to make furniture.

The cataclysmic changes in the Western economy and political map resulted in an amalgam of classical styles, Byzantine skills and northern traditions. This period, called Romanesque (AD 1000–1300) was notable for its unsettled and unstable way of life, which resulted in generally sparsely furnished homes which had furniture that could be easily moved at will. This mobility is remembered in a variety of European languages in words such as mobili, möbel and meubles.

Chests and boxes of all sizes were the commonest articles of furniture. They ranged from the simple dugout tree trunk, through domed-topped and detachable lidded versions, to six-plank or boarded chests. Cupboards and presses were sturdily constructed and brightly decorated, and tables were trestle types or semicircular in shape.

Chairs were still a sign of rank, and the style of a chair reflected one’s position in society. Both simple turned chairs with pegged members and box-seated chairs were decorated with carving, applied mouldings and arcading. Stools with turned legs were common, but the X-shaped or faldsthul (folding stool) was more convenient.

### 1.3 Medieval

#### Background

For much of the Medieval or Gothic period, a large part of Europe was at war or in an unsettled state. The feudal system limited the ability of most of the population to own any furniture other than the basic necessities, and most craftsmen were only employed by powerful churches or nobles. In 1215 the Magna Carta was signed and became a basis for an English Parliament and system of law which gradually developed to support a growing merchant class. During the 1350s the Black Death led to serious depopulation, which indirectly brought about the end of the feudal system. It was not until 1485, when the Wars of the Roses were brought to an end by a victorious Henry Tudor, that a firm monarchy could be established and bring peace and prosperity to England.

Owing to these difficult conditions, few items of furniture were needed and those that were available were made to be portable or collapsible. Scanty furniture contrasted with the prestige of textiles, hangings, gold and silver plate and carpets, which were portable as well as useful and luxurious.

In the history of furniture, the architectural shell has always had a great influence on design. Gothic architectural forms are overriding in any discussion of medieval furnishings or designs. The Gothic style was all pervasive over much of Europe, and is evident in all furniture forms in most countries. However, the beginning of a Renaissance in Italy in the early fifteenth century changed forever the way furniture was made, decorated and used.

#### Functional types

It is important to remember that domestic requirements were generally very limited, although there are records of very finely furnished interiors for elite residences. Seating remained a prime use of furniture. Benches were made in the same way as three-legged stools, i.e. legs were pushed into holes and pegged with wedges. Thrones remained symbols of authority: examples could include the Coronation chair, Dagobert’s bronze throne and the silver throne of King Martin of Aragon.

Chairs developed in England, France and the Netherlands, based on a box-like panelled structure, possibly derived from chest construction.

The chest was arguably the most important piece of medieval furniture. Chests, which, as previously mentioned began as dugouts or trunks, had developed by the fourteenth century into a type that was made up from solid planks, nailed or pegged together. From the fifteenth century, some chests were made using a framed construction thus reducing the undesirable consequences of both shrinkage in inadequately seasoned timber and the normal movement of wood in service.

Apart from chests, cupboards began to be made for storage (Figure 1.3). German exam-
amples of Gothic armoires were most impressive, originally having been painted in vivid colours. The buffet, another display and storage item, was made with a stepped-tier construction for displaying silver items. It depended on rank how many tiers were made and used. A second type, not stepped but canopied, evolved into a cupboard as it became enclosed. The armoire or aumbry, originally a safe, became a livery cupboard, used to store food. Tables were based on the trestle principle.

The four-poster image of beds is not always an accurate description, as many had testers suspended from the ceiling or were fitted with a headboard instead. Italian beds were different, having head and footboards rather than a tester. Box beds remained popular as they were built into the fabric of the house.

**Design and construction**

The relationship between architectural decoration and furniture was important, so it is evident that there would be some use of the same

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**Figure 1.3** Late medieval oak English livery cupboard. Planked and nailed construction with carved gothic open tracery forming the ventilation panels in the doors.

**Figure 1.4** Chest types

(a) Solid hewn or dugout chest (up to the fifteenth century). These were made from a solid baulk of timber from which the interior had been bored out or dug out with an adze, axe or chisel. The unhewn end walls varied in thickness but were prone to shakes and splits that radiated from the pith of the log. The timber was often reinforced with multiple iron straps. (b) Clamped front chest (thirteenth to seventeenth century). These were constructed from planks rather than hewn from solid baulks of timber. ‘Clamp’ refers to the boards that form part of the front and rear of the chest and extend past the base of the chest to act as feet. (c) Ark type chest (thirteenth to eighteenth century). These were a variation of the clamped front form that were usually, though not exclusively, used for storage of grain or bread. The lid was not originally hinged or fixed to the base. This allowed the lid to be removed and used as a kneading trough or hand barrow. (d) Six plank or boarded chest (through the Middle Ages and up to the nineteenth century). These were made from thick planks of wood, usually oak, that were pegged or nailed together and often reinforced with iron strapwork. The grain of the front and back planks ran horizontally. The sides were often extended in length to form feet and as a result the grain ran vertically. This method of construction restrains the movement of the timber in service and as a result splits in the front and back panels are common. (e) Framed and panelled chest (from the sixteenth century onwards). The panels are fitted (not glued) into grooves in the (mortise and tenoned) frame components. Movement in service of the panels is unrestricted and therefore the panels do not split. Frame and panel construction produced chests that were strong and comparatively lightweight.
motifs. For example the shallow geometric carving that is found on much medieval furniture is clearly taken from the stonemason’s tradition.

In the early part of this period, furniture-making was a branch of carpentry. This was because there was no demand, in England, for a separate trade of cabinetmaker, because the nature of house building and furnishing allowed for the carpenter, and later the joiner, to manage all the work required. Indeed, the relation between the building and its furnishing was often close. Some furniture was dependent upon the wall and bedsteads were often part of the wall. Other receptacles were formed by building doors over recesses in the wall thickness. The construction of chests, stools and trestles all came within the remit of the carpenter. Boards were pegged to each other, and chests and boxes were bound with iron bands to try to minimize the effects of warping. Chests were sometimes made with internal vertical stiles that formed feet as well as a frame. Although uncommon, a crude dovetail joint was known in chest construction. Examples of chest construction are shown in Figure 1.4.

**Tools and techniques**

Perhaps one of the most important changes in furniture-making in this period was that from nailed and pegged board construction, to framed-up construction. The reasons for these constructional changes and the pace at which they occurred are difficult to fathom, but three separate theories have been proposed. First, the desire for lighter, more easily moved furniture, which introduced sawn timber and panels rather than baulks and boards. Secondly, the invention of the water-powered saw mill in Germany in the early fourteenth century could have made it easier to convert logs into thinner panels and more manageable boards, especially in comparison to the older methods of two-handed pit sawing. Thirdly, there is an obvious benefit in not having timbers that split. Whatever the reason, the class of workmen called joiners, from the end of the fifteenth century, were encouraged to develop skills of artistry only previously known to masons and smiths. Panelling of ‘wainscot’ (quarter-sawn oak) became popular for interiors once timber conversion had become easier. This new-found delight encouraged changes such as allowing the wood members of bed-testers, posts and headboards to be exposed rather than hidden beneath cloth, and, more important, for ornament to be produced from the wood itself, rather than the painting or applied metal work. The construction method still necessitated mouldings to be worked in the solid and for masons’ mitres (where joint and mitre do not coincide) to be used. This was discontinued in the sixteenth century when true mitres began to be constructed. Frame and panel construction is illustrated in Figure 2.29.

**Surface decoration and finish**

Carving was one of the most popular methods of furniture decoration in the Gothic period. Chip carving and piercing made it possible to reproduce many of the designs (tracery and roundels for example) that were based on stonemasons’ work. The carving motif most recognized is the linenfold design that was used on wall panelling and furniture towards the end of the fifteenth century.

Apart from these carving techniques, inlay or intarsia, painting and gilding were also used to decorate furniture. Painting was particularly important during the period 1200–1500 and the
conjunction of polychromy and carving generally falls into two groups, those items in which painting makes the design and those in which painting is a colouring medium for ironwork or carving. In the later Gothic period there was a trend towards less decoration in England, whilst in France and the Netherlands more decoration and elaborations were demanded.

**Organization of the trade**
As with many medieval trades, the superior craftsmen organized themselves into guilds. Furniture-making guilds were established for carpenters, carvers, gilders, joiners, turners, smiths and leather workers. One of the earliest was a turner's guild, established in Cologne by 1180, and in the late fourteenth century a menuisier's guild was founded in Paris, but the differentiation between 'furniture-makers' and carpenters existed, in France, well before the fourteenth century. Carpenters were responsible for large-scale structural work, whilst joiners developed techniques for exacting and accurate construction of interior furnishings. The trade of coffer-maker apart from making trunks and coffers was also responsible for the embryonic craft of upholstery.

### 1.4 Renaissance to Industrial Revolution

#### 1.4.1 1500–1600

**Background**
The revival of classical thinking in Italian city-states combined with a new way of thinking about man's role in the world order, had begun to change the whole way of life by the sixteenth century. There was a search for a replacement to the all-pervading Gothic style and the Renaissance was the result. The Italian achievement soon permeated most of Europe and inspired men to master the sciences, engineering and literature as well as the arts. The invention of printing, around 1440, encouraged the dissemination of pattern books which ensured that the new ideas, patterns and designs would be available to a wide marketplace.

In England, the Wars of the Roses destroyed the old feudal system and encouraged the growth of a middle class. The economy improved, and the role of the monarch was secured by Henry VII and his Tudor dynasty. The new wealth encouraged house building using braced-timber methods of post and beam construction. There was subsequently a demand for furniture to equip them.

Voyages of discovery, linked to trade with the East and the eventual opening of markets in the colonies led to an increase in profits, but also became the route by which new ideas of decoration and construction, as well as a variety of exotic materials, could be introduced. For example, there is an interesting connection between Florentine pietre dure and the same sort of work being undertaken in India at the same time.

The Renaissance spirit was developed into Mannerism in Italy and France during the sixteenth century. This had the effect of introducing the Grotesque, the Moresque, strapwork and perspective into designs. It was during Elizabeth I's reign (1558–1603) that the Mannerist style manifested itself in England with a vigour appropriate to the times.

**Functional types**
The range of furniture types was influenced by the decline of the hall as the most important room, and the rise of a variety of other rooms for private use. The distinction between furniture and fittings was also more marked as a greater variety of moveable furniture was made to accommodate the demands of the new and more stable society.

In England the trestle table was now longer, and made with a fixed top using a panelled construction and a fixed underframe. The most important innovation, however, was the extending table mechanism, which allowed the leaves to be drawn out upon tapered bearers (lopers) so virtually doubling the size of the table top (*Figure 1.5*).

Chairs, developed from a box-panelled shape possibly based on the chest with a back added, gradually began to be less heavy, more open and usually fitted with arms. They were given a slight rake to the back, but the legs remained straight. Chairs continued to be made by joiners, often with prestigious ornament inlaid into the backs of joined chairs.

The bed was usually the most expensive piece of furniture and was considered an heirloom. Four-poster beds were enlarged and fitted with highly carved canopies and testers,
often with the frame separate from the end posts.

Storage became more important and the idea of a cupboard made the transition from 'a cupboard with things on, to one with things in'. The raising of a chest on tall legs gave the first sideboard or table, and the planked hutch gradually developed into the court cupboard and buffet. Nevertheless, chests remained the most important storage devices and were available in a wide variety of forms, shapes and sizes.

France developed two items that deserve mention: the 'lit de repos' or daybed, lavishly decorated with drapes and materials, and the 'caquetoire' chair with its trapezoidal seat and narrow carved back, which was invariably decorated with carved or pierced back panels.

**Design and construction**

During the early part of the sixteenth century, tenon-jointed frames, pegs and dowels were used to make the panelled construction that was in general use. This had been introduced from Flanders in the fifteenth century. The frame and panelling technique could be either left open for chairs, stools or tables, or enclosed with the panels for wall covering, boxes, chests and settles. During the sixteenth century the development of the true constructional mitre allowed the mouldings to be precut on the stiles and posts before assembly rather than being cut like masons' mouldings over the true joint. Thus the basic techniques of making were established and would serve the joiner well, until the advent of the cabinetmaker in the later seventeenth century.

Turning created some of the more elaborate chair forms during the sixteenth and early seventeenth century (*Figure 1.6*). The description 'turned all over' gives an indication of the design. These chairs, the work of turners, were different from traditional chair construction in that their joints were usually dowelled and pegged rather than mortised and tenoned.

**Figure 1.5** Diagram of a draw-leaf table, shown fully extended and with the centre panel removed. This design was introduced into England around 1600 by European craftsmen and is often associated with the drawings of Hans Vredeman de Vries (1527–c.1604)

**Figure 1.6** Turned or ‘thrown’ chair with triangular seat, early seventeenth century
**Materials used**
The choice of materials during this period remained limited to native woods, especially oak, linked with other materials such as leather, iron and textiles for the particular requirements of an item.

**Tools and techniques**
The conversion of timbers to useful sizes for joinery has always been of prime concern to woodworkers. In the early period, oak logs were converted by splitting with a beetle and wedge, or riving iron, or by being sawn in a saw pit. The first method was quite successful as it did not waste anything in sawdust and the split timber followed its natural grain. It was also less labour-intensive than the two-man saw pit. It did not, however, give such a level surface and this unevenness may have suggested the linenfold motif. For levelling processes the adze was used. During the 1560s the first wooden bow fretsaw was introduced to enable joiners to cut small pieces for inlaying. For working mouldings, a simple scratch tool was used.

**Surface decoration and finish**
The trades of turner, carver, inlayer, painter-stainer and blacksmith all assisted the joiner in decorating furniture.

It was only in the 1560s that the merits of turning were fully appreciated. Although it had been used for making rudimentary chairs, it was in the middle of the century that turning became an essential part of furniture decoration. Large bulbous melon-like turnings, sometimes called cup and cover, were popular on table legs and bedposts. Constructionally unnecessary, they illustrate the fashionable nature of furniture decoration by this time. Some authorities also relate the shapes to the male clothing fashions of the time. These bulbous shapes were often carved with gadroon motifs, scrolled acanthus leaf work and capitals.

During the sixteenth century, carving was a highly prized method of decoration which comprised mixed Gothic and Renaissance motifs followed by Mannerist hyperbole (Figure 1.7). In the early part of the century,

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**Figure 1.7** Examples of carving styles: (a) gothic; (b) strapwork; (c) Renaissance
these included the so-called ‘Romayne panels’, which were carved profile heads set in medallions; Gothic curved rib panels; tracery designs and Grotesque ornament. These were mostly achieved by shallow chip-carving using a chisel and gouge. Later in the century the Mannerist strapwork, an intricate arabesque or geometric ornament, carved in low relief, was used on flat panels, along with developments of the grotesque which encouraged virtuoso work in the form of carving ‘in the round’ for table and buffet supports.

Inlays of woods such as holly, box and Irish bog oak were chosen to produce polychrome effects which were particularly used on chair backs and the so-called ‘Nonesuch’ chests with their pictures in perspective \( \text{Figure 1.8} \). Trompe l’oeil perspective techniques of intarsia, particularly in Italy, are good examples of the Mannerist decoration of interiors which influenced furniture decoration.

Although there were examples of painted and gilded finishes, the fashion for wood inlays and carvings resulted in the use of other methods to protect the surfaces. Oil polishing with linseed and nut oils was the first method to be used, with the use of beeswax and turpentine following towards the end of the sixteenth century.

**Organization of the trade**

From the fifteenth century, guilds or companies represented the interests of woodworkers. The Carpenters’ Company was incorporated in 1477 and the Joiners’ Company in 1570. The Turners’ Company was incorporated in 1604 whilst the Upholders’ (who dealt with beds, hangings and cushions) were recognized as a separate ‘mystery’ in 1360 though waited until 1626 for a charter.

### 1.4.2 1600–1700

**Background**

The period between 1600–1700 is marked by a number of significant changes; economic, political and religious. Economically the period was one of relative prosperity and growth, with the ‘mercantile system’ being established in which a favourable trading balance was to be maintained. Politically it was a time of upheaval, culminating in the Civil War of 1642–49, the Commonwealth and the reduction of the powers of the monarchy. With the Restoration of the monarchy in 1660, Charles II introduced manners and ideas from European courts. Newly fashionable furniture and craftsmen were imported into Britain, and trading links further encouraged an interchange of ideas and designs with Holland, Portugal and the Far East. This flow of continental talent was enhanced after 1685, when Louis XIV revoked the Edict of Nantes which resulted in Protestant Huguenot craftsmen coming to Britain, particularly with textile weaving skills.

This period was also the beginning of architect-builders. Under the patronage of Charles I and his court, for example, Inigo Jones developed the ideas of Palladio and the Baroque. The extensive building programme with luxurious interiors was not limited to London: many fine country houses were built at this time which incorporated classical planning and detail.

Although having emphasized the fashionable bases for changes in furniture design and making, it must be pointed out that there was also a development of regional styles based on local centres of production which contrasted with the internationalism of the capital cities of Europe.

In addition, the colonization of North America brought existing European traditions to that area, which could exploit the vast tracts of timber including oaks, maple and pine. Although some American furniture of the
period reflects the dour and simple Pilgrim style, many surviving examples demonstrate a healthy delight in the use of paint, carving, mouldings and turnings to decorate surfaces. Apart from the English traditions, the influence of Dutch work was also important at this time. The Dutch immigrants of the seventeenth century who settled in isolated areas in New Jersey, Long Island and the Hudson river valley brought the kas, for storage, which remained a staple (either plain oak, painted, or inlaid) piece of furniture. Other design features such as elaborate turnings, complex curves on cupboards as well as sensible multi-purpose furniture resulted from Dutch originals.

**Functional types**

Between 1600 and 1640 the demand for fashionable furnishings and the desire to keep up with the court encouraged the growth of the trade, as furniture became more common and began to be regarded as a necessity rather than a luxury. Although comfort became a major consideration, furniture was now as important for show, as for practical use. There was a move to develop furniture types for special purposes, especially to increase comfort. The farthingale chair is one of the best-known, made to accommodate the fashionably wide skirts of the period, but at other end of the century also the tea table is a response to the social habit of tea drinking. In addition to this, houses were divided into more special purpose rooms, each demanding a particular set of furniture.

The chief characteristics of furniture in the first half of the seventeenth century include a smaller and lighter feel than the Elizabethan, with more restrained ornament. Chairs continued to be made in massive and solid forms, but there was a demand for comfort and luxury, such as was found abroad. The result of this was the beginning of upholstery. The earliest examples were simply based on stretched coverings over a frame. This developed into the X-frame chair which was supplied with loose cushions. The farthingale chair mentioned above was often covered in Turkey work, a canvas with a knotted pile, introduced to imitate Turkish carpets. The settle was sometimes further developed into a combination piece, with the back turning into a table (called a monk’s bench). In America, the chairs characterized by turned spindles have been known as Brewster or Carver chairs, based on the possible original owners, but many chairs still relied on English models as the basis of their design.

The Elizabethan models for tables continued into the new century but with a tendency to reduce the amount of carving and the thickness of legs. Initially made from built-up sections, they were later made just from the thickness of the leg timber. Gate-leg tables, with circular, rectangular or oval tops, were developed to suit smaller family living quarters. This form of table demanded some improvement to the hinge so that the leaves could be dropped more carefully.

The development of the court cupboard and the buffet was a major feature of the Jacobean period. Both forms originated in the previous century but the later versions were noticeably less decorated and were not made with a canted upper stage (*Figure 1.9*). By the 1650s they were a shadow of their former glory and gradually disappeared from fashion. The development of the chest into its final form with drawers, began with the introduction of the 'mule' chest which had a single drawer in the base. It was not then a big step to introduce the drawers into the whole carcase.

During the period the range of chests, cupboards and boxes expanded and examples relate to regional styles as much as any other furniture type. In America they range from the simple six-boarded variety to more decorated panelled and carved versions. The famous Hadley and Hartford types attest to this local tradition. These sometimes have a drawer underneath the proper chest, a harbinger of a new form – the chest of drawers. The forms of court cupboards and presses in America again followed English traditions.

The Commonwealth period (1649–1660) is often seen as a severe style with little emphasis on comfort or convenience and with few new initiatives in design or production. Fashion was in abeyance during this Puritan period, which was clearly one of little ornament. However, turned work became more elaborate, as exemplified by bobbin and ball turning. During the 1640s the ‘Yorkshire and Derbyshire’ chairs were produced with their distinctive knob-turned front legs, and back consisting of two wide carved crescent-shaped
rails. In this period, leather was no longer slung as a seat but instead used as a close covering, fitted by brass studs.

The exuberant epoch that occurred during the reign of Charles II (1660–1688) was followed by a restrained period under William and Mary (1689–1702). Nevertheless, the whole period was one of change in form, construction and decoration. There was a rise in the taste for Oriental objects, and a further increase in the desire for comfort. Pieces were scaled to fit the smaller rooms in the newer townhouses and there was generally a lighter touch to furniture designs. The period was one of success in economic and political terms and this was reflected in a demand for more and better furniture.

To satisfy this demand a number of new or improved items of furniture came into the repertoire of the furnisher. These included: clocks with long cases; easy chairs with high backs and wings (at the end of the period); chests of drawers; chests on stands; cabinets on stands; bureaux; scrutaires; card tables; daybeds; chandeliers and sconces; girandoles; looking glasses; hanging corner-cupboards; dressers.

**Design and construction**

The first half of the century saw the culmination of the ‘age of oak’. Conservative attitudes to design and change resulted from the unsettled political situation. By the mid-century there was a diminution in the influence of architecture which gave cabinetmakers the opportunity to develop decorative techniques of their own, without being tied by the strict constraints of classical detailing and architectural features. The influence of styles and techniques based on the original homes of immigrants to North America meant that particular traditions were taken across the Atlantic and established in localities that continued these ways of designing and working.

Without a doubt the most momentous change in this latter part of the seventeenth century was the need to introduce new methods of construction. These were required so that the new fashions from the Continent could be supplied by English makers. The introduction of veneering, using walnut, hastened the transition from oak panelled and joined construction to bring the true cabinetmaker to the forefront of the trade.

Joined chairs remained important and back stools or armless chairs were an innovation. By the Restoration, twist turning had become a typical feature of the period, and the tall-backed walnut chairs with caned seats and back panels are easily recognizable (Figure 1.10). Constructionally they were not always sound, since in many cases, seat-rails were simply placed on top of the legs and dowelled instead of being tenoned in between. However, the introduction of the splayed back leg does show some consideration for the possibility of overbalancing. The double-scroll Flemish leg changed to a Dutch bandy-leg which gradually led to the cabriole shape. By the 1690s an inverted cup and trumpet were used for legs on tables, tallboys and cabinets. These leg shapes are illustrated in Figure 1.11. Castors, using leather or wood rollers, were
introduced around 1690. Daybeds or couches, with six legs, had cane and carved or turned wood decoration to match the chairs. Settee-backs were divided to resemble chairs joined together, and in dining chairs drop-in seats and the stuff-over method were both used.

Tudor storage forms continued with some modification until the Restoration when the court cupboard was abandoned in favour of the cabinet-on-stand, with either a twist-turned or scroll-legged base. Chests became the dominant furniture item in many rooms but dressers, cupboards, china cabinets, writing desks and bureaux, and bookcases were all made to meet the particular requirements of the time. Bookcases, some with hooded pediments and most with nailed shelf-bearers, became popular: the first one recorded was made for Samuel Pepys. By 1670, small handmade brass screws, which were tapered and slotted, had begun to be used for hinge fixing in place of nails. In America one particular form of storage developed which clearly shows the influence of a European homeland. The ‘kas’ was based on original models from the Low Countries, particularly Holland, where a painted finish tradition was also borrowed.

With the increase in business, letter writing and the spread of literature, the need for specialist furniture again became evident. Bureaux were first made in two halves and later the sides were of one piece. They are distinguished by the panelled doors which were sometimes fitted with mirrors. Writing tables were often designed with recesses for knees and were usually made with cabriole legs and apron pieces. The secretaire is made so that the whole of the front drops down to form a writing top, with the interior invariably fitted out with various pigeonholes and cupboards. The decoration was often in the form of marquetry but in some of the bigger items the veneers were not large enough to cover in one piece, so the quartering technique was devised which turned a necessity into a decorative practice.

**Figure 1.10** High-backed cane chair, English, c.1680–1700. Usually executed in walnut, or painted or stained beech

**Figure 1.11** Leg shape comparison: (a) double scroll leg, c.1675; (b) S-scroll or ‘bandy’ leg, c.1690; (c) cup and trumpet leg, c. 1690; (d) cabriole leg, early eighteenth century
The large panel size also caused difficulties with the fall front groundwork. The drop-flaps were often made with the grain of the main panel(s) running horizontally and the sides fixed with frames in a vertical manner. This led to differential movement and resulted in cracked veneers.

China cabinets were another example of objects designed to meet specific needs. The collecting of Oriental chinaware and 'curiosities' was very popular in the later seventeenth century and it was a matter of course that a display case was required which included glazed doors. The subdivision of doors by small glazing bars appears to have been necessary, due to the size of the glass panes, but it was so successful, decoratively, that it remained popular even when the glass was big enough to fill the space in one piece.

Beds became very tall and exuberant, surmounted by testers with all the woodwork covered with fabric. Beds are good examples of changing taste, for whilst at the beginning of the century they would have been proudly carved, they were now hung with expensive fabrics, being demonstrations of the upholsterer's art rather than the carver's.

Mirrors and picture frames were considered essential to a stylish interior, but mirror glass was still expensive and only made in small panes. Nevertheless, freestanding and wall-mounted mirrors were extremely popular by the end of the century. Lime-wood carving in naturalistic forms is associated with the last part of the century and particularly with Grinling Gibbons. It is his style rather than his artefacts that are memorable though.

Tables with space-saving attributes were made including those with gate-leg mechanisms, butterfly tables and even chair-tables.

**Materials used**

The early part of the century was still dominated by the use of oak, and all the time that wood was seen as a constructional material, rather than a decorative one in its own right, this would remain the case. However, by the reign of Charles II, oak was becoming displaced by walnut, beech, cherry, cedar, olive, yew and laburnum, as well as burrs of various woods. These woods worked well in veneer form, thus encouraging the replacement of oak for carcases with the more stable yellow pine.

The use of veneers opened up the decorative possibilities of parquetry, marquetry and oyster veneering (see below). The use of ebony in some cabinets in the first half of the seventeenth century, combined with bright, contrasting inlays of ivory, tortoiseshell, pietre dure etc., showed how the architecturally influenced form was becoming subservient to the cabind-made surface effect. In America the use of local woods continued. In addition to oak, ash, maple and pine were widely employed in both joined furniture and chair work.

Canework, originally of Chinese origin, found instant success in the 1660s, and by the end of the century cane-workers had established themselves as part of the furniture-making fraternity. Cane never usurped the position of textiles, but its use as a flexible and decorative material for chair seats and backs ensured its popularity. It was most commonly used in this period in conjunction with carved and perforated splats for chair backs and seats.

Metal working began to be subdivided from the work of smiths into the more specialized trades of locksmiths and mount-makers. A certain interest in a more sophisticated approach to metalwork is evidenced by the growth of the process of chamfering the edges of metal mounts. Stop-chamfering was a further development which made an even more decorative outline by leaving some parts of the edge straight.

During the second half of the century, brass began to displace iron, and began its monopoly in the manufacture of cabinet mounts. This was due to the fact that brass was a good colour, easy to work and, by casting, could be reproduced accurately. The results were ideal for use on the lighter forms of furniture that were characteristic of the later seventeenth century.

In the seventeenth century, 'tortoiseshell' (actually turtleshell) was widely used both in Italy and the Low Countries. As it was malleable when heated, it could be used as a veneer. Laid in conjunction with metals such as brass and pewter on coloured grounds, it represented a high point in marquetry work. This process is usually associated with André-Charles Boulle (see below).

**Trade practice, tools and techniques**

The qualities of furniture-making still depended on the skill of the joiner, who began
to use the continental dovetailing methods of joining boards which foreign craftsmen had introduced into England.

The ardent desire of tradesmen to maintain differentials resulted in the London Court of Aldermen (in 1632) deciding that carpenters should be restricted to making nailed and boarded work and that only joiners could use glue, mortise and tenon and dovetail joints. It was this process that divided the joiner’s craft into those who fitted up rooms, for example with panelling, and those who would be called cabinetmakers.

By the second half of the century the cabinetmaker was supreme, one of the earliest references to a ‘cabinetmaker’ being in Samuel Pepys’s diary in 1664. The increasing division of crafts and trades continued with chair makers, cane chair makers, japanners, turners and other crafts, developing their specialities.

Drawer construction is a reference point for the skill of cabinetmakers, and drawer development is related to the rise of the cabinetmaker (Figure 1.12). The frames were invariably of oak, possibly due to the wearability on sliding surfaces, whereas oak and

![Figure 1.12](image)

**Figure 1.12** Development of dovetailed drawer construction. (a) Up to around 1650: Sides fit into a rebated drawer front and are butt jointed at the back. Note that sides are thick (up to one inch) to accommodate the groove. Grain of drawer bottom runs front to back. (b) Up to about 1700: Drawer sides have a single coarse through dovetail at the front and are butt jointed at the back. The drawer front was veneered. Runners sometimes added to lift the drawer bottom clear of cross rails in the carcass. (c) From around 1670: Coarse lap dovetailing may be found. (d) Around 1700: Drawer sides have two or more coarse lapped dovetails at the front and through dovetail/s at the back. Drawer sides can be thinner now they are not grooved. (e) Around 1700: Drawers now slide on runners and both drawer bottom and runners may be rebated into the drawer side. (f) Early eighteenth century: Lipped drawers concealed through dovetails with an applied cross grain moulding. (g) From the early eighteenth century: Dovetails further refined as multiple pins and tails introduced. (h) From around 1715: cockbeading added to drawer fronts to protect veneer and as a decorative feature. Drawer bottoms with the grain running from side to side begin to be used from the first quarter of the eighteenth century. (i) From the last quarter of the eighteenth century: Dovetails become finer. Whilst the side and bottom cockbead remain in rebates, the top cockbead is the width of the drawer front and requires a half mitre. Drawer bottom fitted into rebated slips that are glued to the drawer sides.
pine were used for drawer fronts. The fixing of drawers by hanging them on runners and grooves was improved by drawers sliding on the dust board. The grain of drawer bottoms at first ran from front to back but was later changed to run from side to side. Drawers with dovetailed fronts replaced nailed and rebated ones. After 1670, the crude through dovetailing of the fronts of drawers used in the early part of the century was replaced with lapped or stopped dovetailing which gave a better ground for veneering.

Early panelled work used mouldings that were run on oak and used as a framing surround. By the seventeenth century, mouldings for cornices, plinths, friezes, edges of tables, drawers and so on were important for decorative effect and were usually finished with cross-grained veneer. The cavetto (hollow) shape was used on tall chests and the half-round on carcase fronts; the double half-round was used between 1700 and 1715. On drawers after 1710, an ovolo moulding was set so that the join between the opening and the drawer was hidden when closed.

**Turning** Until the early seventeenth century turnings were produced on dead-centre lathes, driven by treadle or wheel or on the pole lathe. For much of the century, knop and ring turning and bobbin turning were repeated but towards the end of the century there were some contrivances introduced that allowed a twist or spiral to be put in on the lathe rather than by using hand-rasping to achieve the effect.

**Surface decoration and finish**

In the first half of the seventeenth century, cabinet work was often decorated with split turnings and raised faceted mouldings that were applied to surfaces and sometimes painted black and inlaid with bone or mother-of-pearl. Carving was generally flatter than previously, with acanthus scrolls, guilloche, lunettes and gadrooning. The Commonwealth period encouraged simpler decoration. From the Restoration, decorative processes became very important again due to the practice of veneering cabinets.

The techniques associated with the use of veneer (Figure 1.13) include cross banding, marquetry, parquetry and oyster veneering. All these practices involved applying veneers of decorative wood to a suitable substrate, sometimes separately, other times in conjunction with each other. In most cases banding was part of the scheme as it provided a finished edge treatment. Parquetry and oyster work used woods to create a geometric effect, whilst ‘seaweed’ marquetry used arabesque designs to great advantage. Although seaweed marquetry appears to be the height of the marquetry cutter’s skill, it was relatively straightforward in that only two woods were used – box or holly for the pattern and walnut for the ground. The skill in seaweed marquetry was in using a very fine saw to keep to the design lines and at the same time cut at an angle, to ensure as close a fit as possible between the pieces. These methods were often the only way certain woods could be used satisfactorily.

There was a great demand for floral marquetry in the last part of the century, perhaps because it depicted the popular Dutch flower painters’ scenes; at any rate it certainly showed the skills of the cabinetmaker. By the end of the century, marquetry was toned down to two shades of brown. Veneers were also carefully matched to form geometric patterns by book-matching or quartering.

Interest in oriental products, particularly imported lacquer wares, encouraged European makers to attempt to copy them. Oriental lacquer imported into Europe had two distinct type characteristics. One type had the oma-
ment in relief; the other, sometimes known as Bantam work, had the ornament incised or cut into the surface. The process was imitated by ‘japanners’ who cut out a pattern in a gesso ground then coloured and gilded the result. In 1688 John Stalker and George Parker published their *Treatise of Japanning and Varnishing*. This publication identified three elements essential to the art of japanning. These were gums, metals and colours. The gums were used to prepare varnishes; metals were used in powder or dust form and were worked into the varnish, and colours were put down to make backgrounds (Figure 1.14).

Around 1660, varnishing was introduced as an alternative wood finish. Stalker and Parker (1688) also gave recipes for shellac spirit-varnish which was used for coating all sorts of wood products. After the application of each coat, the spirits evaporated leaving a thin film of shellac on the surface. After this had been built up to ten or twelve coats, it was given a high polish with a mineral called Tripoli. This high quality finish was favoured for walnut and later for mahogany and satinwood. In other cases oil was used hot, to rub into walnut to give it a ‘black and sleek’ appearance.

Japanned cabinets were often made to fit onto gilded or silvered stands. These stands were roughly bosted and then gesso was applied in thin coats. Once it had hardened, it was re-carved, sanded and gilded. After the Restoration, the fashion for gilding required both water gilding and oil gilding processes to be used. Water gilding required a wet clay base, which was sometimes double gilded and usually burnished. Although this was the finer finish, oil gilding was the more durable method and hence more popular.

Other decorative processes included verre églomisé (the process of decorating glass by drawing and painting on the underside and backing this with metal foil). Mirror surrounds at the end of the century were most likely to incorporate this process, using red or black ground, and silver or gold foil. In the 1670s straw work was introduced as a decorative finish using marquetry designs and continued in popularity through the eighteenth century with an impetus from the French prisoners of the Napoleonic wars.

Around 1680 the earliest Tunbridge ware was recorded. Originally produced in Tunbridge Wells, the process flourished for the next one hundred and fifty years. The process was initially one of tiny cuts of veneers built into a mosaic pattern, often with a cubic or elongated rectangular theme. It should not be confused with the end-grain mosaic work produced there in the nineteenth century.

The use of metal in furniture decoration in the period was not common but did occur. Furniture covered in sheet silver or made from solid cast silver was produced in the Restoration period, though little now survives. During the last quarter of the seventeenth century, boule work was introduced which used brass or pewter inlays in a tortoiseshell base, sometimes framed by an ebony veneer. André-Charles Boulle worked in Paris as *ébéniste du Roi* from 1672 and his distinctive process was adapted by Gerritt Jensen for his work in London. The boule process is considered similar to marquetry in that both sheet materials, metal and shell, were cut simultaneously. Recent research seems to show that early boule work was not necessarily cut in this way, but individually from the same pattern. It
was only in the eighteenth century that multiple cutting (of several pattern repeats at one time) was adopted.

1.4.3 1700–1800

Background

Despite the wars that were a feature of parts of the period (War of the Spanish Succession, 1702–14; Seven Years War, 1756–63; War of American Independence, 1775–83; French Revolutionary and Napoleonic Wars, 1789–1815), this century was a period of sustained growth in wealth. In England the monopoly on colonial trade, the growth of a National Debt and the economy of war all led to this new affluence. Landowners controlled the country, finances and industries and encouraged a market for luxury furnishings, but the general population growth also encouraged development of cities, agriculture and internal trade.

In America, developing cultural and trading conditions combined to make Boston and Philadelphia important furniture-making centres, with Newport, New York and Charleston not far behind. Distinctive regional characteristics continued to develop, often based on the original location of immigrants. However, American colonists also gradually took on the Classical revival principles of order, balance and reason which were manifested in their architecture and furnishings.

Another tradition which was away from the mainstream was the ‘folk art’ furniture made in centres such as coastal New England which acted as a transmitter of design ideas to the interior. The furniture produced in rural New Hampshire, the Delaware valley, Chesapeake Bay, Carolina, Piedmont, Tennessee, Mississippi and Ohio, and by particular groups such as the Pennsylvanian Germans, or Norwegian Americans in Wisconsin and Iowa, demonstrates the very particular design and technical vocabulary that each represents. In addition, the Spanish territories in New Mexico continued a different tradition. Simple models of Spanish origin and in traditional form included alacenas (wall cupboards), repisos (shelves), tarmita (stools) and trasteros (cupboards). They were often made in pine and simply decorated with painted motifs or chip carvings.

By the mid-eighteenth century, the need to import furniture into America had declined as increasingly sophisticated designers and makers competed for trade, so that furniture-making was a well established urban craft. The development of an infrastructure of craftsmen and raw material suppliers and wholesalers combined with freedom from guild restrictions and other regulations helped to develop a healthy trade within North America. Examples of well-known craftsmen include Thomas Afleck, William Savery and Benjamin Randolph, all exponents of the Rococo style. In Newport the Townsend-Goddard family dominated furniture-making for well over one hundred years. By the later eighteenth century Samuel McIntyre and John Seymour were among the famous craftsmen.

The eighteenth century saw vast changes in the development of the applied arts and furniture and furnishings to meet the various demands put upon the trade. Often called the ‘Golden Age of Furniture’, this century included some of the greatest names in English furniture history and witnessed the change from the Baroque (c.1670–1720) to the Rococo (c.1720–1760) and then a Classical revival (c.1760–1800). These three divisions coincide with the major designers and craftsmen of the century. William Kent was the major design influence along with the Gumley family, Benjamin Goodison and Mathias Lock; all representing a high quality interpretation of Baroque/Palladian designs. The second or Rococo period centres on Thomas Chippendale, Ince and Mayhew, Johnson and Manwaring. It was also the age of the pattern book. By the third period, the Classical revival, spurred on by excavations in Italy and the eastern Mediterranean, was the fashionable and popular style. Robert Adam is synonymous with the period but he alone was not responsible for the style. Both Hepplewhite in the 1777–90 period and Sheraton from the 1790s to 1806 were important exponents of the neo-classical style.

Functional types

At the beginning of the eighteenth century, Queen Anne’s reign saw an English taste assert itself, characterized by using walnut with plain, simple elements. For its effect it relied both upon the Baroque outline, and the natural beauty of the timbers used. Early Georgian
furniture by contrast was generally heavier and with larger proportions, due to the influence of William Kent, who developed coherent furnishing schemes under his architectural direction.

Queen Anne chairs were noticeably restrained in their added decoration, although the most important feature to come out of this period was, without doubt, the cabriole leg. Introduced in the late seventeenth century, and perfected in the beginning of the eighteenth, the cabriole leg with its uniting of two opposing curves was seen as the epitome of the curvilinear design. Compound curves were introduced into the hoop backs of chairs, and stretcher braces disappeared as construction techniques improved. Chair types began to proliferate and included hall chairs with hard seats, often decorated with coats of arms; upholstered easy chairs with embroidered coverings; two-seater sofas or love seats and the vernacular Windsor chair type. From around 1745 the Rococo influence and the use of mahogany allowed chairs to be made in a lighter and more delicate fashion.

Settees by Kent included solid hall seats with carved scroll arms, and an upholstered type in velvet or damask with parcel gilt and mahogany, or gilded-gesso frames. The second half of the century saw the introduction of confidantes, settees with seats at each end with upholstered divisions between them.

Numerous table types were introduced during the century. These included: console tables with marble tops and painted frames; dumbwaiters; writing desks; kidney tables; tea tables; sofa tables; library tables, and toilet tables. For dining, the gate-leg table, still in use in the early part of the century, was superseded by the swing-leg table. Other tables included a tripod tea table, essential for the ritual of tea-drinking. In addition to tables, sideboards with cutlery boxes and wine cisterns were prerequisites for the fully furnished dining room by the second half of the century.

A vast range of storage furniture was designed and made in the eighteenth century for the requirements of the new age: China cases for displaying or storing; bookcases to furnish libraries; collectors’ cabinets for curios; corner cabinets for the display of ornaments, and a wide variety of double chests, clothes presses and commodes.

Other items that were introduced in the period were chamber or exercising horses, pole screens, pedestals for supporting decorative items and elaborate girandoles for lighting schemes.

**Design and construction**

The eighteenth century has been divided into a variety of eras for different purposes. The most suitable for furniture studies is either the stylistic distinction between Baroque, Rococo and the Neo-Classic, or the dynastic division between early Georgian, mid-Georgian and late Georgian or Regency. Throughout these divisions other stylistic influences occur either disparately or in conjunction. The Chinese taste from the middle of the century to the end is evidence of an Oriental passion; a Gothic mode was popular from the middle of the century onwards and both the Classical revival (under the influence of Adam), and the Greek revival, in the last decade of the century were part of the Neo-Classical revival (Figure 1.15). The period was also important for the influence of particular cabinetmakers and their publications which have also been used as period names.

The conjunction between material and method is best seen in the Rococo designs that were suited to mahogany. Due to this material’s strength, ribbon back chairs, cabriole legs, Chinese style frets and lattice-pierced galleries

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![Figure 1.15 Neo-Classical commode, 1773, designed by Robert Adam, from the Drawing Room, Osterley Park House. The commode is veneered with satinwood, harewood, rosewood and other woods, some stained green, and has ormolu mounts](image-url)
could be made in profusion. The Rococo style was promoted by the Saint Martin's Lane Academy, set up by William Hogarth. The close geographical connection with furniture-makers ensured a speedy application of the style in furniture designs.

Around 1700 Daniel Marot introduced a style of chair with a narrow back which enclosed a vertical solid vase or splat. Cabriole legs changed chair construction by doing away with the stretcher bars, which resulted in a wider knee. Shoe-pieces for backs were now pinned and glued to back rails, and seat rails were rebated to accept drop-in seats. Chair seats were now broader. Legs were decorated with carved acanthus foliage on knees, and were finished in a ball and claw foot. Upholstered backs became common. During George II's reign, legs became even more elaborate, with high relief carving and decorated seat rails, with solid splats replacing pierced ones. These features remained essentially the ingredients of armchairs through the mid-century. There were, though, innovations, changes of scale and detail, for example: the introduction of the square section leg with stretcher bars; the ladder-back dining chair; fretted and latticed work in the Chinese style, and various Gothic motifs. Adam's French influence is apparent in his chair designs based on the oval back and taper-turned leg, whereas the neo-classical influence was found in the round, or rectilinear style of backs. Hepplewhite introduced the shield-back, oval and heart shapes for chair backs. It is noticeable that most of his chair backs are supported by the upward elongation of the back legs. Sheraton's chairs were generally designed with square backs and frequently had square section legs which were slightly tapered. For economy they were often made from beech and finished with paint.

In America regional preferences were manifested in the design and construction of chairs. For example, New England side chairs were tall and had legs formed by turned and joined stretchers. New York side chairs were broader and lower than the New England ones. Whilst in Philadelphia the chairs were larger in proportion, did not usually have stretchers and were sculptural in form. The importance of Windsor chairs should also be stressed. Probably first developed for outdoor use, painted green, they soon became an important furnishing item and were made in a wide range of shapes and styles that reflected local taste and craft. A particular Windsor form with a writing arm was developed in America.

Early Georgian cabinets were relatively plain if made from solid wood. This return to plain, solid wood, as opposed to the veneering practices of the previous period, encouraged architectural detail to be applied, to relieve the surface. Heavy cornices or broken pediments, fluted pilasters and mouldings were added as decoration, and some cabinets were supported on cabriole legs. The heavier chest bases used the angle-bracket foot for supporting carcasses on the floor. Cabinets with serpentine fronts and convex sides and front were popular in Europe and sometimes received interest in England. Details include the use of bail or loop handles and astragal mouldings on glazed bookcase doors.

From 1750 onwards the influence of France is seen in the Rococo mounts used. Sometimes they were supplied by the French or they were indifferently copied and chased by English workmen. In 1762, Boulton's factory in Birmingham began to make high quality mounts, which were sometimes gilded by the mercury process – the result being known as ormolu. From the 1750s solid back-plates on handles were replaced by two roses, one at each end. By 1800, ball or loop handles were replaced by brass knobs or lion masks, holding rings.

In American cabinet work the flat topped high boy was a particular development and so was the use of a decoration called blocking, which refers to the concave and convex profiles of panels on the fronts of cabinets or chests. This was almost exclusively used in New England. Much other American cabinet work relied on English models.

Mahogany flap dining tables often had four or six legs with oval or circular tops and used the gate-leg principle to support the flaps. By the mid-century it was common to extend a dining table by adding two semicircular pier tables at each end of the gate-leg table. From 1715 folding-hinged frames were introduced on card tables, in contrast to the swing-legs used previously. By 1710 kneehole writing tables had been introduced as one example of a number of special-use objects. Around 1730 card tables with square corners were introduced. By 1750 the tea table or tripod table...
was used and it soon developed a tilting mechanism by being hinged to a small cage. From 1770 the ‘Carlton House’ style table was introduced (Figure 1.16).

The early part of the eighteenth century is marked by the use of needlework for upholstery, and the rise of the wing chair, which remained popular throughout the century (Figure 1.17). From around 1725, bergère chairs, characterized by a long seat and a raked back, were introduced from France. By the middle of the century, upholstery had become less visually important, but was used in conjunction with carved wooden frames for chairs and a wide variety of special types of seating furniture and hangings.

Beds remained important pieces of furniture, but gradually became lighter in construction with draperies reduced to a minimum and the woodwork again becoming important, the posts being reeded and slender and the canopy often pierced and carved. The so-called Angel bed, which had its tester hung from the ceiling, was introduced. Other new bed designs included the French ‘Lit à la Polonaise’ and the ‘Lit à la Turque’. Field and tent beds also became popular towards the end of the century. When draperies were used they often included crewel work or other embroidery.

**Materials used**

The range of woods available to eighteenth century cabinetmakers had gradually increased as trade with America, West Indies and the coasts of south America developed. In America itself, walnut, tulipwood, gumwood, cedar, cherry and mahogany as well as maple and walnut veneer were added to the cabinetmaker’s repertoire. In England the fashionable taste for walnut encouraged the importation of Virginia black walnut to augment European supplies. Although the era is well known for the use of mahogany, walnut was still acceptable as a fashionable timber up to the 1750s. However, in 1721 the abolition of duty on mahogany encouraged the first major imports, which were mainly from Jamaica. Spanish mahogany (sometimes known as Baywood) from Cuba or Honduras was also shipped to England, and towards 1750 it came into general use. San Domingo shipped another variety, which was very hard and straight grained, and was ideal for carved designs that would require a crispness to them. All mahoganies were used extensively in the solid and in large boards (avoiding joined up panels for table

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**Figure 1.16** A mahogany English Regency Carlton House table

**Figure 1.17** Upholstered wing chair, English, mahogany, second half of the eighteenth century. The textile cover, embroidered with silks and wool, is somewhat earlier
tops), as well as in veneer form. Apart from its rich colour and handsome figure, several other virtues established mahogany as an ideal cabinet wood that allowed the extraordinary designs in chair backs to be executed by Chippendale and his followers (Figure 1.18). It is strong, hard, tough, uniform in structure, dimensionally stable, durable and resistant to splitting. Mahogany remained important for the rest of the century. Satinwood was used in the second half of the century for its fine figuring and rich golden yellow colour. Supplied from both the West and East Indies, it was mainly used in veneer form. Robert Adam and Sheraton both incorporated it into their designs, as it suited the lighter touch furniture of the latter part of the century.

The trade in timber was international. In 1747 Campbell in his London Trades mentions ‘... deal from Norway, wainscot from Sweden, mahogany from Jamaica and wall-nut from Spain’. Yellow deal from the Baltic, and red cedar from North America (after 1750), were extensively used for carcasses. Many other foreign woods were used especially in veneer form for marquetry and banding. Calamander or Coromandel came from India and Ceylon. Woods from South America, especially from Brazil, included kingwood, partridge, zebra, and tulip woods. Amboyna came from the East Indies and red cedar from North America, whilst thuja was imported from Africa. Domestic woods were used to imitate the imported ones. Birch and horse chestnut were substituted for satinwood and acacia for tulipwood. Harewood was produced by staining maple or sycamore, using salts of iron, which resulted in a green–grey tint. The Windsor chair used only indigenous timbers, usually elm for the seats, beech for the spindles and yew for the frames. In America these timbers were often hickory, ash, maple or tulip.

The principle woods used during this period in America were walnut, and a little later, mahogany. Maple was also used in New England and Pennsylvania, and cherry was used in New York.

Scagliola This was an imitation marble or rare stone material made from fine-ground plaster of Paris mixed with glue and colourings and marble or stone chips. It was originally made in Italy and was very popular for table tops. Although table and commode tops were often imported from Italy, by the second half of the century there were some makers in England supplying the needs of the furniture and carving trades.

Tools and techniques of conversion and construction
During the eighteenth century there were few developments in methods of construction or of the use of new tools. There were, however, some efforts made that were to assist developments in the long term. These early attempts included the 1761 Society of Art’s Prize to Stansfield, for his sawmill design, and in 1793, Bentham’s comprehensive patent for woodworking machinery. Developments such as lathe-turned screws which were being produced with slotted heads to fix handles, and Maudsley’s construction of a sliding tool holder in 1797 which enabled screws to be made more easily, were aimed at woodworkers other than furniture-makers. Their influence was not to become important until the nineteenth century.
One process of construction that continued without question was the use of plies and laminates of wood for the construction of chair splats and fretted galleries. The use of plies in mid-eighteenth century work was merely a solution to a problem; it was not seen as a momentous technical advance. It was evidently common practice for larger plies to be used as well. Sheraton describes the construction of his Universal table by saying ‘... the pannels are sometimes glued up in three thicknesses, the middle piece being laid with the grain across, and the other two lengthways of the pannel to prevent it warping.’ More deliberate developments occurred in the work of Chapius in Belgium, and Samuel Gragg in the United States. Both men made chairs with bentwood components but the process was subordinate to the ruling taste in design terms. Tambour doors were introduced from France in the latter part of the century and were used as decorative falls or covers for night tables, pot cupboards and desks.

Furniture historians are indebted to the design books of the eighteenth century not only for their designs, but also for general practical details of construction. The works of Plumier, Diderot, Roubo and Bimont are invaluable for their extremely detailed accounts and illustrations of furniture and woodworking practices in eighteenth century France.

**Surface decoration and finish**

The eighteenth century was a period of ever-increasing choice in matters of decoration and finish. Marquetry, turned work and lacquer work gradually went out of fashion. Carving and free-flowing curves became popular as Rococo forms were introduced in the 1730s. These were based on imaginative compositions of scrolls, shells, foliage, figures, masks and animal forms, and were undertaken by a specialized group of chair-carvers. These hardwood carvers were distinct from the frame-carvers who worked picture and mirror frames in softwood.

Gilding became popular in the first half of the century due to the influence of William Kent. He designed parcel-gilt decoration for furniture objects as well as wholly gilded pieces, especially console tables with matching gilded looking-glasses. The gilding process became part of the repertoire of the softwood carver as it became associated with mirror and picture frames. Many businesses advertised themselves as carvers, gilders and picture frame makers.

In 1770 there was a revival of painted furniture, due mainly to the influence of Robert Adam. Painting direct onto primed wood was the usual method, with the designs forming garlands, medallions and borders. Sometimes the base veneer was visible; otherwise, the whole cabinet might be painted in light colours as a background for the designs. Adam motifs included festoons of husks, vase figures, honeysuckle, paterae, ram heads and medallions. The painting was linked with various finishing methods such as carving, inlay and ormolu. There was a close association between painting and japanning, often with the japanner painting the ground and applying the varnish whilst the more artistic furniture painter applied the detail. By 1800 painted furniture was far more popular than marquetry.

The combination of other materials with timber was most fashionable in the case of ceramic plaques and medallions. France’s use of porcelain plaques during the reign of Louis XVI was also copied in England by the use of Wedgwood plaques in the latter part of the eighteenth century.

Finishing processes included lacquering or japanning, varnishing and polishing. Japanning remained popular through much of the century although the process gradually was simplified and cheapened by omitting priming, and substituting materials such as bronze powder for gold. Fine examples of japanning can be found on Chippendale’s work for the bedroom at Nostell Priory, but the decoration on Garrick’s famous suite is executed in tinted varnish on an oil paint ground, a more common technique by the last quarter of the century. In North America carving began to supersede turning, except on Windsors, as a major decorative technique and japanning was also important. The japanning technique was highly developed in Boston. In this work, the use of smooth maple wood fronts with pine frames obviated the need for gesso to be used so the ground was prepared using white size covered with numerous coats of varnish.

Transparent finishes for woodwork, such as clear lacquer, improved during the eighteenth century, the most famous being ‘Vernis Martin’,
patented by the Martin Brothers in France. In 1730 they were granted a monopoly for imitations of Oriental lacquer, but their best-known products are the smooth lacquered panels used in many applications and often based on grey, green or blue base colours with painted decorative scenes. The painting was then given an antique effect by craquelure which was then lacquered over with a clear glaze.

Sheraton’s *Dictionary* gives four methods of polishing wood surfaces. These are (a) unsoftened wax rubbed with a cork for interior surfaces; (b) turpentine and beeswax with a little red oil applied and polished off; (c) linseed oil (which may be coloured with alkanet) and brick dust which produces a polishing ‘putty’ which will secure a fine polish; (d) a hardish composition of wax, turpentine, copal varnish, red-lead and colour worked into a ball, used for polishing chairs.

**Organization of trades**

Eighteenth century furniture-making was characterized by the variety of crafts that were the constituent parts of the trade: carvers; turners; joiners; chairmakers and fancy chairmakers; cabinetmakers; clock-case makers; japanners; turners; gilders; looking-glass and picture frame-makers; and upholsterers. The success of many businesses is exemplified by the description from 1747, when it was said in a *General Description of all Trades* that: ‘... many of their shops are so richly set out they look more like palaces, and their stocks are of exceeding great value’. An example of the entrepreneur–maker was the business of Thomas Chippendale, first recorded working in Long Acre. By 1753 Chippendale had opened a workshop in Saint Martin’s Lane, London and in 1754 he had published *A Gentleman And Cabinet-Maker’s Director*. This was to be one of the most influential pattern books published in the period. Among other designer-makers were Vile and Cobb from Saint Martin’s Lane. Between 1759 and 1763 the business of Ince and Mayhew was responsible for publishing a Universal System of Household Furniture, which had over 300 designs in it.

In 1788 George Hepplewhite’s *Cabinet-Makers’ and Upholsterers’ Guide* was published. This was in fact two years after his death, when the business was being run by his widow, Alice. The publication was a successful venture and ran into three editions before 1794.

Between 1791 and 1794 Thomas Sheraton’s *The Cabinet-Maker’s and Upholsterer’s Drawing Book* was published. It encouraged an economic approach to design with a light delicate touch. This economy in materials, space use and cost resulted in simple, elegant or compact furniture items. In 1803 his *The Cabinet Dictionary* was published. It is doubtful that Sheraton ever made furniture or had a workshop as his business was teaching and drawing, nevertheless his designs demonstrated the delicacy, strength and desire for utility that are hallmarks of the last part of the eighteenth century.

The situation in America developed slightly differently. Although the apprentice, journeyman, master system based on the old guild practice continued, there was a degree of freedom of movement and flexibility of employment that allowed craftsmen to move around whilst learning the whole business of furniture-making. This had the effect of maintaining local styles of construction, design and decoration but also allowed for some influence from other shops and traditions.

For much of the eighteenth century the French trade was controlled very strictly by the guild system, which did not allow the several distinct trades to cross over. The divisions were *menuisier* (solid wood and joiner), *ébéniste* (veneered cabinetmaker), *fondeur* (metal mounts), *ciseleur* (bronze chaser), *vernisseur* (lacquer-worker), *marqueteur* (marquetry–panel maker) and *doreur* (gilder). From 1743 the guilds demanded that all pieces made were stamped with the maker’s initials and the JME (*juré des menuisiers et ébénistes*) mark. The control of the guilds was limited to an extent, as royal makers were exempt from the controls, as were makers outside the city boundaries. In addition to the makers, the businesses of the *marchands-merciers* must be stressed in their role of taste-makers and decorators.

### 1.5 The nineteenth century

**Background**

The growth of nationalism and liberalism, in part stemming from the French Revolution, provided the background for the changes that were to make this the century of transition. The
reforms in education (1870 Elementary Education Act), representation (1832 First Reform Act), transportation and communication were all part of a tendency towards improvement, growth and material gain.

The so-called ‘Industrial Revolution’ has been blamed or praised as a prime mover in changing the way furniture was designed, made and used during the nineteenth century. There is no doubt that there was a redistribution of wealth that encouraged more spending on furniture and furnishings but overall there was only a gradual change in the furniture industry and this was piecemeal.

Other changes such as accessible steam (and later electric) power, personal communications and the mechanization of many parts of industry all helped to improve the infrastructure that was necessary for a burgeoning economy. Living conditions improved immeasurably assisted by medical improvements and this in turn laid stress on the notions of comfort and well-being.

Following the Revolutionary War of 1776 in America, the taste for a neo-classical style was further developed in the Federal period (1780–1810), which was followed by a Graeco-Roman revival up to 1835, both of which continued to echo European fashions. As in Europe, fashionable historical revivals followed.

Architecturally the search for a style for the new century was confounded by the demands of the new age. Railway stations, hospitals, courts, museums, factories and warehouses all made demands on architecture that it was ill equipped to handle. The search for and the subsequent battle of styles, led to an eclectic approach to architecture, and consequently furniture design, which resulted in a series of revivals and other configurations. This was combined with what was perhaps the most important social change, the usurpation of the aristocracy as arbiters of taste in favour of a prosperous middle class.

The romantic literature of the period, exemplified by Sir Walter Scott, led to a troubadour or medieval style. This vied with a more scholastic Gothic revival urged by A.W.N. Pugin. Associated with these was the Tudor or Jacobean style. In contrast there was a demand for a continuation of the classical taste, which included a Greek and an Egyptian revival. The French Rococo was seen as an especially suitable style for the newly wealthy. All these styles led to an interest in old furniture and the reproduction of original pieces. In France there were similar movements: a Gothic revival; a Louis XVI revival between 1815 and 1840; a Louis XV revival between 1830 and 1930; and a further Louis XVI revival between 1850 and 1900.

In the United States a Rococo revival was manifested in the work of Henry Belter, Charles Baudouine and Alexander Roux. A Gothic revival was advocated by A.J. Downing and Clarence Cook, whilst the so-called Eastlake style was popular, perhaps due to the relatively inexpensive production processes associated with it.

This muddled state of affairs was recognized at the time and one of the aims of the Great Exhibition of 1851 was to identify the weaknesses of English design and compare it to foreign efforts. The confusion led to some attempts at combining reforms of a social nature with design and making in the form of the Arts and Crafts movements. In 1860 William Morris’s business was founded, and in 1875 Arthur Liberty’s first shop was opened. In 1882 the Art Workers Guild was founded and in 1888 the Art and Crafts Exhibition Society was established. In 1902 the Guild of Handicraft was founded by C.R. Ashbee.

The linking of progressive architects with the ideals of the Arts and Crafts movement has been seen as one of the foundations for the modern movement that was to come in the twentieth century.

In the United States of America two different evolutionary paths were evident, the major one being the trades connected with enterprises in the major cities and populous areas. They followed the trends set and maintained standards appropriate to the growing moneyed classes. Both cabinet-work and upholstery was made to reflect the growing status of the new establishment. In contrast were the settlers moving west, who were often only part-time craftsmen. Whatever furniture was not brought with them had to be built. Furniture was based on a make-do philosophy when there were more important issues to consider. Once there was some settlement, some furniture was made with care and thoughtful use or reuse of materials. Once frontier establishments had grown to a sufficient size the exchange of labour was
possible and specialist chair or furniture-makers could set up shop. The obvious conjunction between raw materials and a market place with water or steam power meant expansion as the towns became regional centres of supply. When the physical frontier had been reached, another trend was noticed. The wealthy eastern consumers were looking to the wild and the rustic as a source of design inspiration and purchased furniture made from cattle horns, or established summer camps in the wilder parts of the east. The Adirondacks were home to a complete style of rustic furniture which to some extent reflected the romantic vision of the frontier and the ‘good life’.

One important American group who produced a very particular ‘style’ of furniture were the Shakers. A religious group, the Shakers reached their peak in the 1840s. They lived in communal groups in centres across the United States. Shaker design follows simple traditions that would have reflected the vernacular origins of the group members. Although they made for themselves and their own use, the Mount Lebanon community also made furniture for public sale. The practicality and simple lifestyle encouraged furniture that was easily stored and cleaned, that was functional and not overtly decorative. Early furniture was painted, but later the simple varnishing of plain wood resulted in a functional and decorative surface. The range of woods reflects their attitudes. Hickory or oak for chair slats being easily shaped; maple for door knobs as it is durable; cherry for table tops as it dense and solid. Many other slight differences such as the number of slats, the seating method etc., can often identify the workshops. The qualities of the Shaker furniture are once again appreciated both in the original models and in numerous reproductions.

**Functional types**

1800–1830 The fashion for classical purity was introduced from France by Henry Holland, developed by Thomas Hope in his *Household Furniture and Interior Decoration* of 1807, and popularized in the trade by George Smith’s *Collection of Designs for Household Furniture* of 1808. Graeco-Roman ornament was precisely reproduced and Grecian chairs, with wide shoulder boards and sabre legs, became fashionable. Two new types of table are associated with the early nineteenth century: the centre pedestal table and the sofa table. Smaller tables included quartetto table nests and work tables with pouches. Small writing tables abounded. There was also a return to fashion of longer dining tables. Sideboards gave way to large serving tables, and small bookcases with wire trellis doors became a feature. There were developments in the manufacture of metal bedsteads and campaign furniture and a craze for so-called patent furniture, which was often able to be converted from one use to another (Figure 1.19).

1840–1900 During this period two new chair designs were introduced: the balloon-backed dining or bedroom chair and the prie-dieu or kneeling chair. Various other furniture types were introduced including canterburies,
chesterfields, chiffoniers, davenports and cosy corners.

From the mid-century onwards there was a growing variety of new and exciting furniture designs that were not slavishly copying traditional designs. This furniture, designed by architects, craftsmen or artists was gradually associated with the beginnings of the modern style. North America and most European countries were affected. In Britain the rise of ‘Art Furniture’ was initially encouraged by designers such as Bruce Talbert and E.W. Godwin, whilst the craftsman–designer was represented by Ernest Gimson, Lethaby and Barnsley. By the end of the century, Voysey and Mackintosh represented the new designers. In the United States, Herter Brothers, Associated Artists and Tiffany, Stickley and the Roycrofters, the Greene Brothers, and a little later, Frank Lloyd Wright all exemplified the new thinking.

In France the two schools of Paris (represented by Guimard, Gaillard) and Nancy (Galle, Majorelle) were style leaders by the end of the century. In Belgium Van de Velde and Horta were developing the Art Nouveau, whilst in Austria, the Vienna Secession (Hoffman, Moser, Olbrich, Loos, Wagner) were using modern geometric shapes. In Germany the Jugendstil was represented by Behrens, Endell, Riemerschmid and Pankok. Other more exotic designs were produced by Gaudi in Barcelona and Carlo Bugatti in Italy.

**Style and type of construction**

The early nineteenth century is called the Regency period in England or the Empire style in France. The style of the period in both countries aimed to adapt newly discovered archaeological remains and the furniture therein to represent their new society. In 1804 Baron Denon published the results of his exploration in Egypt following Napoleon’s campaign, and this provided authentic sources for copying models for the Egyptian craze that followed. In addition to this style there was a taste for the Oriental and Chinese in particular. To achieve these effects the use of beech, turned and painted to imitate bamboo, was common. The use of lacquered or japanned panels in carcass furniture was also part of the taste.

Regency furniture can be identified by dark, glossy wood offset by brass inlay, trellis work galleries, lion’s paw feet, masks, star-shaped bolt heads and studs. Angularity of shapes was often accentuated by reeding on chair legs and cabinets as it was considered that ancient furniture was nearly always angular.

Early Victorian furniture was characterized by the revivals mentioned above but from the 1850s onwards upholstered lounge suites were popular, comprising: sofa, a pair of spoon-back chairs and a number of smaller balloon-back side or dining chairs. These remained available well into the next century in one form or another.

High-quality cabinet work was produced during the period and is evidenced in the international exhibitions where countries and manufacturers tried to outdo each other with the spectacle of their products. However, it is as well to remember that the exhibition pieces were just that, and are not representative of the productions made for the retail market.

In Germany and Austria, the rectangular, plain, neo-classical style named Biedermeier was popular. It had similarities with the more academic classicism of Schinkel. The success of the bentwood industry run by Thonet and others is discussed below. It was not until the unification of Germany in 1870 that the individual states and their local traditions began to be subsumed into a German style.

In France, the high-quality eighteenth century traditions continued, with Paris remaining the centre of the trade. Oak continued to be used as a base timber for cabinets, whilst beech was used for chair frames. There are examples of drawer linings and chair frames being made in walnut, but these are exceptions. The French construction process continued to use the goujon or peg that was used in the eighteenth century though its use gradually died out during the nineteenth century.

From the 1870s, attempts to influence furniture design by the Aesthetic movement were successful. The ideas taken from Japanese art and design produced a lighter and more delicate range of furniture. This was made by art furniture-makers. E.W. Godwin was the most important designer in this field, his productions using carefully balanced components, combined with Japanese materials such as stamped leather and netsuke. They were often ebonized and fitted with silver components. The Japanese taste extended to poor copies of art furniture, often comprising standard designs embellished with fretwork. Far more successful
on a less elite level was the use of bamboo and other Japanese products such as grass cloth, lacquer panels and leather papers.

The last quarter of the century saw a taste for Moorish and Middle Eastern styles characterized by pierced and carved fretwork (sometimes imported from Cairo and named Cairene), inlay, carpets and cushions and potted palms.

In the United States this style was also promoted by designers and makers such as the Herter Brothers and Louis Comfort Tiffany who worked for clients who wanted furniture to reflect the contemporary aesthetic sensibilities. On the other hand the Colonial revival of the 1870s onward, revealed a nostalgia for America’s past, whether it be from 1620 or 1820. As well as an interest in the antiques of the past, the revival was also a response to the fully blown Victorian furniture that was rejected by other groups such as the Arts and Crafts movement and often for similar reasons.

During the century the attempts by the furniture industry to meet the demands of the growing population for stylish and even ostentatious furniture were decried by design reformers. The problem was that reformers could not break out of the system. Reviving traditional methods and materials would inevitably have been very expensive and the introduction of plain, simple furniture would not have been appreciated by most people. This is not to say that efforts were not made to attempt to improve taste. The reformers mentioned above all tried to introduce new ways of thinking about furniture design but most missed the point about the public’s demand for quantity of ‘work’ and costly looking materials.

**Materials used**

The search for novelty and control of material and cost resulted in an eclectic range of materials being used during the nineteenth century.

The Regency period favoured striped figured timber, especially rosewood, calamander and zebrawood, all of which would contrast with the use of brass. From 1840 African mahogany was imported as a substitute for the expensive Central American type. Walnut remained popular in Scandinavian countries where exotic woods were too expensive. The Biedermeier style in Germany favoured mahogany in the north, and yew, cherry, or maple in the south.

The developments in using plies of wood continued with experiments in Europe and the United States. One of the most successful was the Gardner company of New Jersey, who patented a chair seat using perforated three ply.

The search for substitutes encouraged many inventions associated with the imitation of wood. The simplest was the method of mixing fine glue and sawdust or wood raspings to a paste to be put into a mould and allowed to dry under weight. Composition ornament (a mixture of whiting, animal glue, rosin, and linseed oil) was pressed into a mould and allowed to dry. It was then applied to a surface.

J.C. Loudon recommended the use of metal for furniture in his *Encyclopaedia* and illustrated some very advanced, as well as revivalist styles. The use of cast iron reached a high point during the mid-century. Established manufacturers turned to the expanding furniture market to supply garden seats, tables, jardinières, hallstands and other static items. Metal was also used in upholstery. From 1830 coiled springs were used and iron-framed chair backs were produced in quantity to give a flexible but strong support to easy chairs. Twisted wire for all kinds of furniture was especially popular around 1870 in the United States.

In the early part of the century a taste for tabletops of marble or stone became fashionable. British marbles and spars became popular and it was inevitable that attempts would be made to imitate them. The use of enameled slate by E.G. Magnus was so successful that the marble industry gradually declined.

The period from 1835 to 1870 can be considered the heyday of English papier mâché (*Figure 1.20*). There were several varieties of papier mâché, the two main ones being pulped paper and layered paper. The first was mainly used for small-scale applied decoration, e.g. cornices, mouldings canopies and other applied ornament that could be used on furniture. The second type was used to make parts of furniture using a mould. This process produced blanks which could then be decorated. In 1825, Jennens and Bettridge took out a patent for pearl shell ‘inlaying’ for papier mâché. This well-known process, which was not actually inlaying, used slivers of pearl shell applied to the surface and varnished over. The important decorating process was based on a black background and an applied painted design.
During the 1850s gutta percha was introduced as a furniture material. It was a rubber-like material that could be moulded into a variety of shapes and designs. However, due to cost increases and problems with damage, it was discontinued before it could become fully established. Other organic materials such as deer antlers and other animal horn were used to produce eccentric chairs particularly. Rustic furniture was also made from logs and roots. Bamboo and its painted imitation has been mentioned above in association with the Regency style, but it was revived again in the latter part of the century for whatnots, hallstands, flimsy tables, and so on. Basketwork, wicker and rattan were all pressed into service to make furniture, but especially chairs. The distinctions between the various materials cause confusion. Wicker refers to the plaited twigs or osiers of willow; cane is the outer bark of the rattan palm used for weaving seats, whilst reed is the inner core of the rattan. Cane is also a generic name for bamboo and malacca reeds which are made into a large variety of utensils and equipment, as well as furniture. The role of Cyrus Wakefield and Walter Heywood in the development of cane and reed in furniture is important. By the mid-century Wakefield had developed the rattan used for packaging into a furniture-making material by processing the reed and the cane. Heywood introduced power looms to weave cane into a continuous web to avoid handwork; he also substituted the rattan with its pith, the reed, which was susceptible to staining (and could therefore be coloured).

The period experimented with a variety of other materials that were essentially unsuitable for furniture-making or decoration. Coal, glass, lava, liquefied quartz, ferns and even seaweed were experimented with and in some cases patented. More important developments included machine-made screws in the 1850s and the first machine-made tacks in 1860.

Innovations in upholstery related to springing, and metal frames have been mentioned. Much effort was expended in trying to find substitutes or improvements in fillings. The use of curled horsehair was standard but other ideas included plant fibres, seaweed, and natural sea-sponge. The more likely stuffings were wood-wool, shredded fibres, animal hair and flock. An interesting substitute for leather was developed in the period. Although known since the fourteenth century, oil or leather cloth or Rexine, was originally made with a linseed oil coating. In the second half of the nineteenth century it was coated with a mixture of oil and liquid celluloid (cellulose nitrate).

**Tools and techniques**

The use of machines in the conversion of raw material and the construction of furniture during the nineteenth century is a story of both important changes and minor developments. The development of machines such as circular saw planers, mortisers, borers, dovetail-cutters and veneer cutters for preparing and shaping timber was the most important change, which affected all woodworking industries, including particularly shipbuilding and house building. Machines for processing and shaping parts (bandsaws, fretsaws and lathes) were also being used in larger quantities, as was the third category of machines (embossers, moulders and carving machines), that produced decoration. Similar developments in the textile industry made soft furnishings more widely available.
In 1805, Brunel took out a patent for large circular saws particularly associated with veneer-cutting and in 1807 developed the saw further in association with block-making machinery. The importance of large powered saws for converting timber has been recognized in the development of the timber, joinery and furniture trades. However, one of the most important developments was not on this scale at all. The small circular saw of up to seven inches diameter, often operated by a treadle, was one of the keys to the success of small-scale furniture-makers. This saw enabled makers of cheap furniture to square up, mitre and rabbet cleanly, accurately and quickly, allowing the frames of cheap carcass work to be simply rebated and nailed. This method of rebating, using a circular saw, was particularly useful for drawer-making, which was traditionally a place for using dovetail joints. The advantage of this cheap method was that a dozen drawers could be made in the time it took to dovetail joint just one. This obviously had great advantages when such objects as Davenports and chests were being made.

In the same way as saws, planing machines had been developed by simply trying to replicate the reciprocating human action and in 1776 the first machine was invented by Leonard Hatton. Bentham improved upon this patent, first with a reciprocating plane and then with one based on the rotary principle. Joseph Bramah developed a trying-up machine for use in the Woolwich Arsenal that used a disc cutter mounted on a vertical spindle. These machines were called Daniels planers in the United States and in later models all had horizontal cutter blocks in place of the vertical spindle. All subsequent planing machines were then based on the rotary knife principle.

Attempts to apply machinery to joint cutting again originated with Bentham and his comprehensive patents of 1791 and 1793, but were not commercially viable until the 1850s. In this case it was the United States that led the way. For example, the Burley dovetailing machine, patented in 1855 was alleged to have been able to produce seventy-five to one hundred dovetail joints per hour. Improvements continued to occur in these machines but one that is worthy of special mention is the Knapp dovetailing machine, patented in 1870. It has been pointed out that this machine was significant because it was the first machine that did not attempt to reproduce the hand cut dovetail but rather produced its own peculiar ‘modern machined joint’. Ironically, interest in traditional furniture towards the end of the century contributed to the decline of this obviously modern joint.

The development of bandsaws originated with an invention by William Newberry in 1808. However, it was not until the success of a Msr Perin of Paris, who produced a bandsaw blade that lasted reasonably well, that the machine was really viable and operated satisfactorily. It was again the Woolwich Arsenal that ordered some of the first to be used in England in 1855. The fretsaw or jig or scroll saw, developed from the simple marquetry cutter’s saw, was one of the simplest and most useful tools for the cabinetmaker. Often treadle-operated with a single blade, it could cut out intricate shapes, and satisfy the demand for the most elaborate decoration.

The third group of machines includes two different divisions. First, the patent processes run by companies producing such items as carvings, mouldings and embossed ornament for sale to cabinetmakers (see below) and secondly, the machines that allowed a cabinetmaker to produce the decoration for his own work. The most important of this second group would seem to be the spindle or toupie moulder. It was said that it was particularly useful for Gothic or medieval work ‘as more chamfering can be done by it in one hour than could be done by handwork in a day’.

From a technical point of view the developments in bent and laminated wood were amongst the most innovative in the century. Thonet, with his initial experiments in laminations and subsequent bending of solid timber, began the first large-scale production system based on interchangeable parts in furniture-making. He introduced simple functional designs which enabled him to have a commercial, as well as technical success (Figure 1.21). John Henry Belter came from the same tradition as Thonet but developed his ideas in the United States. His patents related to the bending of laminates of wood in two directions around formers to shape such items as chair backs and bed frames. Belter’s technique was usually hidden behind a large amount of decorative carving.
Surface decoration and finish

The demand for novelty, and the reproduction of expensive processes by imitation, were the two main driving forces behind developments in surface decoration and finish. Many old techniques were revived, along with a range of new patented processes, some of which became established while others were unsuccessful.

The most well-known revival and its mechanized equivalent is carving. During the early years of the century the carving trade was in a poor state. With the revival of historical styles and a demand for ‘old’ pieces, carving was stimulated. However, much of the work for the general taste and fashion was destined to be cut on carving and routing machines. This taste was fuelled by a few schools of carving, developed by the Rogers family in London, Tweedy and Robinson in Tyneside and Kendal and Cooke in Warwick. Most of their work was based on anecdotal scenes, often of great complexity, which remained examples for other makers to copy.

To satisfy the demand for carving, particularly in the Gothic style, machine carving, which had been known to sculptors previously, was applied to architectural woodwork. It was soon used to make carvings suitable for furniture. The most successful of three major companies was the Jordan process, which allowed the model to be copied by moving the material towards a fixed cutting tool.

Pyrography, in which wood is charred by heated iron moulds being applied to the surface, was developed with the result that the surface had an ‘old’ finish built in. Pressure carving or moulding was another technique for imitating the work of the chisel. It was effected by applying moulds, with a design stamped into them, to wood under great pressure. It was especially useful for end-grain medallions. Finally, there was a range of mouldings and applied decoration made from wood waste and other material including colourings and adhesives.

Painting

The decoration of furniture by painting is divided between that with painted ornament on a timber ground and that with an all-over painted ground which is then decorated. The latter process was usually confined to cheaper woods and is often called japanning by contemporary writers: a particular type was called pen-work. This was an imitation of etching which was made by first japanning the furniture black and then painting the design in white japan. Following this was the final process of adding line work with Indian ink and a pen.

Sheraton in his Cabinet Dictionary gives full details on the subject of painting, including the process of painting rush seats. In this instance he warns against the practice of using water colour which was designed to deceive the purchaser. This warning was repeated much later in the century by another commentator talking about painted bedroom furniture which was deceitfully decorated with water colours rather than proper varnishes.

Marquetry and equivalents

During the 1850s and 1860s a number of methods of imitation decoration were invented and patented in response to the demand and the rising cost of the original processes. The boulle revival of the nineteenth century was supported by stamping brass (especially borders) directly into timber.
or by substituting other materials in place of metal and shell.

Marquetry was reproduced by embossing or printing decorative designs onto paper that were then transferred to woods and varnished over. This process was patented as xylography. Another method called diachromatizing used stains to produce a pattern which penetrated the wood. Ready-made marquetry, mouldings and carvings were available from wholesale suppliers in increasing numbers throughout the period.

The revival of interest in pietre dure, where coloured stones were let into an ebony or stone face, continued a tradition that started in Italy in the seventeenth century.

**Tunbridge Ware**  Already known in the eighteenth century, the technique of the process was changed in the early part of the nineteenth century. The method used was to glue a selection of thin strips or rods together in a predetermined way. Once these bunches were dry, they would be sawn transversely to reveal a pattern that could be laid down as a veneer. The mini mosaic effect was best suited to small items, such as trays, boxes, tea caddies and small table tops (*Figure 1.22*). It is thought that only woods in natural colours were used.

**Finishing**  Graining, staining and marbling were all processes that were well known to furniture-makers and were practised widely in the first half of the nineteenth century. These processes enjoyed a revival not only for cost saving reasons, but also because regular supplies of timber were interrupted by the Anglo-French wars. Graining was acceptable and strongly recommended by commentators on interior decoration. However, by the mid-century these practices were criticized as deceits, and towards the end of the century were only associated with low-grade furniture.

The finishing processes were explicitly described in contemporary trade manuals, the most important being Nathaniel Whittock's *The Decorative Painters' and Glaziers' Guide*. Staining was important as a finishing process and it was acknowledged that the method was especially suited to bulk treatments. Whittock mentions how chairs are dipped in large copper vats and allowed to hang and dry. The dye for this process was made from Brazilwood chips and pearlash (potassium carbonate). Other methods included the use of alkanet dye mixed with linseed oil, as a colour enhancer and reviver for mahogany. During the 1820s French polish was introduced. This was originally designed to give a thick transparent coating which would impart a highly glazed effect without changing the colour of the timber. By the mid-century the process had acquired a bad name because staining caused by the polish obliterated the natural colours of the wood and stopped it ‘ageing’ naturally.

**Organization of trades and manufacturing**

In 1803, Sheraton could say that the furniture trade was ‘one of the leading mechanical professions in every polite nation in Europe’. It is still often considered that the so-called ‘Industrial Revolution’ brought furniture-making into a factory situation during the nineteenth century, which, combined with the use of machines, dramatically changed the way furniture was made over the period. This is not the case, although there were undoubtedly some changes. The enduring nature of the trade and its attitudes to change were such that new methods were only espoused if they contributed to profitability. Technological change was not necessary while the older ways met the demand. This is not to say that factories did not exist, simply that there was no dramatic change from one system to another; it was rather a gradual process that is still not really complete.

In England the rise of wholesalers and retail outlets which gradually took over from the comprehensive manufacturing firms was a
major feature, and confirmed the separation of maker and seller. In France, the trade was centred on Paris, often with businesses run by German cabinetmakers alongside French ones. The businesses of Joseph-Emanuel Zwiener and François Linke were two of the most well known. By the 1880s there were around 17,000 workers in the Paris industry alone. By 1790 the marking of goods was no longer a requirement, following the disbandment of the guilds, but was revived in the early nineteenth century by makers stamping furniture or engraving the brass-work with the firm’s name. Rather than a guild control, the stamp was a promotional device encouraged by retailers.

The main input by Austria during the nineteenth century was the development of the bentwood furniture industry. By 1900, the Thonet company employed 6000 workers producing 4000 pieces per day and there were another 25,000 workers employed in Austria alone in other bentwood businesses.

Publications remained an important part of the trade’s network and are indicative of the conservative approach to design. In 1788 the Cabinet-Makers’ Book of Prices was published and was reissued throughout the nineteenth century. In 1802 came the London Chair-makers’ and Carvers’ Book of Prices. In 1803 Thomas Sheraton’s Cabinet Dictionary was published and in 1829 Thomas King brought out The Modern Style of Cabinet Work Exemplified. This was reissued unaltered in 1862, testimony to conservative style. In 1833, Loudon’s Encyclopaedia of Cottage Farm and Villa Architecture was produced. Later in the century the decorators and pundits of various styles wrote ‘how to decorate’ books. These included works by Charles Eastlake, Clarence Cooke, Ogden Codman and Edith Wharton, Christopher Dresser as well as a growing number of magazines and journals.

One of the most important developments in the United States was the expansion of the furniture industry into the mid-west and southern states. Improved transportation and an abundance of water and timber in states such as Indiana, Illinois and Ohio meant that firms like Mitchell and Rammelsburg of Cincinnati or whole cities like Chicago or Grand Rapids and (later) South Carolina and High Point could trade with the East and West Coast centres successfully.

1.6 The twentieth century

Context

The twentieth century, sometimes called the machine age, has seen such a great variety of designs of furniture that generalizations are meaningless. Advances in materials use and production techniques led to major changes in the production of furniture. Designers with a knowledge of materials and techniques that were developed to meet the new demands were employed to design furniture for large-scale production. The division between production furniture and designers’ limited editions grew as the market for furniture increased rapidly.

The twentieth century has produced such a wide ranging variety of forms of furniture that any general statements are not very useful. The variety of factors that have always affected furniture design, i.e. the nature of consuming, the training of craftsmen, the intellectual background, the technical aspects, the critical acceptance of work, and the prevailing style and fashion have been even more varied in the twentieth century so that we can see sculptural fine art furniture through to full blown reproductions of historical styles in modern plastic materials.

These factors led to two separate developments: one, the rise of modernism and machine production and the other, the continued development of the craftsman–designer’s influence. Two important examples of the first are the Bauhaus metal products of the 1920s (Figure 1.23) and the post-war use of synthetics, such as plastics.

The complicated story of the rise of modern furniture can only be hinted at here. Artistic movements including Cubism, De Stijl, Constructivism, Expressionism and Futurism have had degrees of influence on furniture design. However, architects who designed furniture for specific interiors, including Lutyens, Le Corbusier, Mies van der Rohe, Frank Lloyd Wright and Rietveld (to name a few), produced icons of modern design that often have little relation to the productions of the major furniture factories but are symbolic of the twentieth century. After the First World War the fashionable Art Deco style was adopted for commercial as well as high-style furniture. The work of the French designers Jean Dunand, Pierre

Furniture history
Chareau, Paul Poiret, Ruhlmann and Sue et Mare stand as examples of the high quality of craftsmanship and ingenious use of materials. Based on a wide variety of inspirations, it remained popular into the 1930s, when it began to draw inspiration from the Modern movement and streamlining.

The British tradition of Arts and Crafts was continued during the first half of the century, with subtle alterations by Ambrose Heal, Sidney Barnsley and Gordon Russell (Figure 1.24).

In the United States the continuing importance of immigrants is highlighted by early twentieth century designers such as Kem Weber, Paul Frankl and Gilbert Rohde who were to stamp an individuality on American design in the 1920s and 1930s. By the 1930s the oppression in Europe resulted in Bauhaus luminaries being employed in American schools of design, Josef Albers, Walter Gropius and Mies van der Rohe being amongst the most well-known emigres who brought European modernism to America. A version of Art Moderne was developed in furniture and interiors by a number of designers, including Donald Deskey and Bel Geddes. These styles were characterized by streamlined shapes and modern materials, including stainless steel, glass and aluminium.

During the Second World War the inevitable shortages meant that there was a curtailing of decoration, and the Utility scheme was introduced into Britain in 1942. The need to conserve materials resulted in a stark simplicity that was a precursor of contemporary modernism.

After the Second World War, Scandinavian and Italian influences became important through much of Europe and North America. The Scandinavian designers such as Alvar Aalto, Hans Wegner, Arne Jacobsen and manufacturers including Fritz Hansen, were responsible for the successful combination of machine and handwork which had been established by Danish designer Kaare Klint.

In the United States organic design became important after the war. Charles and Ray Eames, Noguchi, and Bertoia were all designing more fluidly shaped furniture which was facilitated by the new materials available. Eero Saarinen’s ‘tulip chair’ is an icon of the period (see Figure 1.27). The importance of manufacturing companies such as Herman Miller and Knoll Associates encouraged modern design as a commercial enterprise.

In the latter part of the century there has been a craft revival or a continuation of the woodworking tradition. In the United States this has been spearheaded by the work of Wharton Esherick, George Nakashima, Sam Maloof and Wendell Castle and in Britain by John Makepeace, Rupert Williamson and others.

Since the early 1980s, there has been a revolt against the orthodoxy of modernism. The
Italian design group Memphis, and individual designers such as Danny Lane, Ron Arad and Phillipe Starck, have introduced a new sense of fun and excitement into furniture design (Figure 1.25).

The major advances in furniture types relate to usage in the twentieth century. Built-in furniture and unit furniture reflect the changing use of space in rooms, and the introduction of do-it-yourself (DIY) and knock-down (KD) forms of construction reflect a new marketing approach to furniture. In addition, the enormous expansion of the contract furniture market has resulted in a whole range of office furniture and equipment that represents a completely new typology.

Materials used
The choice and range of materials available to furniture-makers in the twentieth century have been extremely wide. The continued development of metal, plastics, and wood-based products has been essential to complement the traditional materials still in use.

Metals The use of metal was revived in the twentieth century by Frank Lloyd Wright who developed office furniture made from metal which started a trend that has remained as a type form. The nineteenth century experiments with metal tubing were ignored until Mart Stam and Marcel Breuer in the 1920s developed a cantilever chair. The potential of tubular steel as a truly modern material, ideal for series production, has been vindicated as a number of models from the 1920s were still in production in the 1990s. In other cases, steel bar was bent and polished to produce a highly sophisticated design such as Mies van der Rohe’s (1929) ‘Barcelona chair’. In many instances the use of chromium plate gave the metal a bright finish and there are also examples of a gold colour being applied. Many of the modernist icons were made in chromed steel, including the chaise longue (1928) by Le Corbusier, the Wassily chair (1925) and the Cesca chair (1928) also by Breuer.

Aluminium, prized for its lightweight and non-corroding properties, was used for decorating and making frames for furniture in the 1930s. Marcel Breuer exploited it for his chaise longue (1932) and it was used in 1938 for outdoor chairs in Switzerland to the design of Hans Coray. After the Second World War, Ernest Race produced the BA chair, made from aluminium sections complete with a padded seat. Aluminium went on to be used in cast or spun form in many furniture designs, especially for chair and stool bases and special applications like the frame of the Plia chair (1968). In the 1980s aluminium was again a designer material with outdoor chairs designed by Jorge Pensi (1986) and the sculptural Lockheed Lounge (1986) by Marc Newson.

The use of wire for furniture had its roots in the nineteenth century but in the 1950s the sculptural chair designs of the Eames (DKR 1951) and Harry Bertoia (Diamond chair 1952) introduced the ‘see-through’ chair which was ideal for the open plan interiors of the period.

Metal has continued to be at the avant-garde of furniture design with the work of Ron Arad, Tom Dixon and Kuramata using sheet steel, scrap iron and wire respectively.
Wood-based

For much of the century traditional furniture woods have been used with little change. Oak, mahogany and walnut have been used to make reproduction furniture of varying quality. Other traditional woods have been used in the making of modern furniture. The design phases of sapele mahogany, makore, rio rosewood, American walnut and pine are all testimony to the longevity of taste for particular species. The major twentieth-century timbers that were apparently new to furniture were teak and afomosia. Although previously used in boat-building and furniture-making, these woods were reintroduced to European furniture via Scandinavia.

The century is best known for its technical advances in the treatment of wood. Whether it be improvements in seasoning, veneer-cutting, laminations and plywood, or reconstituted wood materials such as block-board or particle board, the advances were highly important. The developments in manmade boards began with plywood, prepared in sheet form for use as a constructional material in the early part of the century. Its value as a panel board was soon acknowledged. The use of plywood as a ‘designer material’ was developed especially by Alvar Aalto in 1930–1. He then worked on laminated plies in 1936, producing some of the twentieth century’s most famous chairs. Other examples of plywood work include Gerald Summers, Marcel Breuer and the Isokon company (Figure 1.26). Although successfully used in much inexpensive production furniture, the three-dimensional chair forms made from plywood by Charles Eames in the 1940s are amongst the most famous results obtained using this material. Plywood was further developed by other designers such as Arne Jacobsen in his Ant chair (1952) and it continues to be a valuable material. Hardboard or Masonite was a later invention which involved pressing a mixture of wood fibres and adhesives into sheets. It has been used for back panels of cabinets and for packing. Block board and laminboard are two further developments of nineteenth century cabinetmaking techniques that were taken over by timber merchants and made and marketed as constructional panels. However, the most important product in the second half of the century was particle board or chipboard. This board, developed during the Second World War, comprises wood chips of varying shapes with adhesives and fillers which are bonded under great pressure. The board thus produced is extremely strong and flat with no natural faults, making it ideal for the box-like designs of the later twentieth century. This process was developed to use other materials such as flax residues (flax-board) and sugar cane residues (bagasse board). One of the latest innovations is medium density fibreboard (MDF), which is made from wood fibres bonded together with a resin to make a variety of thicknesses of an easily machined and finished board.

Synthetic materials

The astounding advances in synthetic chemistry and the development of plastics have brought unprecedented changes to the way furniture is made. In many cases the skills of the cabinetmaker have been overtaken by engineers skilled in machine development or by semi-skilled assemblers putting together prefabricated parts.

Plastics have been known since the nineteenth century with the work of Alexander Parkes, but their commercial application to furniture-making is a twentieth century phenomenon. In furniture use, plastics have been used for construction, decoration and finishing. The replacement of animal glues with synthetic resins in most assembly and laminating processes is a result of the development in adhesives science. The development of urea-formaldehyde adhesives for veneering and laminating, polyvinyl acetate adhesives for gen-

Figure 1.26 Isokon Long Chair, beech, bent laminated frame, padded plywood seat. Designed by Marcel Breuer (1902–81), made in England, 1936
eral wood jointing, and other specialist adhesives for special applications, releases some of the original constraints on furniture designers. Plastics were used for construction before the Second World War but it was immediately afterwards that they came into their own. The use of sheet acrylics such as Lucite and Perspex was developed in the 1940s along with further experiments with glass-fibre and an increasingly wide range of special plastics. In 1940 Charles Eames and Eero Saarinen developed moulded polyester seats that could be fixed to a variety of underframes and in 1956 Saarinen designed his ‘Tulip chair’ using glass-reinforced plastic for the seat and aluminium for the base (Figure 1.27).

The development of glass fibre reinforced plastic led to a new range of multi-shaped objects, including the Womb chair designed by Saarinen in 1948 and the DAX chair designed by Charles and Ray Eames in the same year. The injection moulding of plastics was a great advance as one-piece furniture items could be made. The most ubiquitous was Robin Day’s chair design for Hille, made from polypropylene (Figure 1.28). Italian designers developed plastics and their processing to a high degree. Two examples from the 1960s demonstrate this. The Blow chair, an inflatable PVC chair (1967), and the Sacco (1968), a bag of polystyrene chips which could be used in a multitude of ways, show how plastics could reflect lifestyles and develop new furniture types. By the 1980s plastics were revived as one of the materials of postmodernism. The use of the ubiquitous plastic laminates was one example.

**Upholstery** The technical changes in upholstery have been related to both the internal structure and the external coverings. At the beginning of the century the spiral compression spring was supreme but in the 1930s spiral tension springs were introduced into Germany and England. This released the designer from having to create a deep section to a chair to accommodate the spiral springs: he could produce a more elegant easy chair whilst retaining the benefits of metal springing. In 1929 the development of latex-rubber cushioning was patented by Dunlop. When made up into cushions, this became an ideal partner to the tension-sprung chair. Post-war developments
included the four-point suspension (a one-piece rubber platform) and the introduction of rubber webbing by Pirelli. Both these processes hastened the demise of the traditional spring until the introduction of serpentine metal springs, which enabled manufacturers to produce a traditional-looking upholstery range without the cost of a fully sprung interior.

Plastics also earned a place in post-war upholstery with the introduction of polyether and polyester foams for cushions and padding. Developments continued with substitutes for most traditional materials, e.g. man-made fibre-fill in place of cotton-fibre wrap. The constructional use of plastics in chairs has been mentioned, but the development of polystyrene shells to create an extremely lightweight frame should be noted. External coverings have been revolutionized by the use of PVC-coated fabrics as substitutes for the earlier leather cloths.

Other There seem to be few materials that have not at one time or another been pressed into service in the name of furniture-making. However, two significant materials that have not been discussed deserve a brief mention. The use of paper, discussed in connection with papier mâché, was reintroduced in a product called Lloyd Loom (1917). This was a material made from metal wire with paper wrapped around which was then woven into sheets so that it could be fixed to bentwood chair shapes. In recent years, cardboard and corrugated board have both been used in the making of furniture, in the case of Frank Gehry (1972), as very limited editions, in another case as throwaway children’s chairs. Glass is the other important material that has been used throughout the century for constructional, decorative and finishing purposes. As a table top, it became synonymous with the 1960s style known as ‘chrome and glass’, although it has been exploited by Art Deco designers such as Lalique as well as contemporary artists such as Danny Lane.

**Tools and techniques of conversion and construction**

There have been great advances in the application of woodworking machines to furniture-making, but no really major advances in machine type. Accuracy and speed increased through the mechanical adaptation of hand operations powered by various independent sources, and by the electrification of hand tools. However, many furniture-making operations remain a mix between machine processes and hand work. Various techniques have been adopted in particular fields to match materials development with technical competence. The Thonet company adapted their experience in bending wood to producing bent metal furniture. Other developments outside the industry also contributed to change. Developments in both World Wars had an effect on furniture production, these included changes in factory management, the increase in the range of new materials, the de-skilling of labour and the application of technology once unrelated to furniture-making. For example, the Chrysler Corporation’s experience of cycle welding to join wood, rubber, glass, or metal was invaluable in the experiments of Charles Eames. He was able to use this technology to fix metal legs, via rubber grommets, to plywood seats.

Undoubtedly, one of the most important changes in furniture-making has been the development of prepared parts and specialist fittings that have enabled semi-skilled operators to make furniture. Precut and finished panels, KD fittings and pre-sewn upholstery covers complete with fillings attached are examples of this simplified approach to production.

The twentieth century furniture factory, making cabinet furniture on a large scale, is organized so that there is a logical sequence of event that takes full advantage of flow line production systems, semi-skilled labour and intensive machinery. The rough end receives lumber and deals with the processes of sawing, planing and moulding as well as veneer preparation. The shaping department follows with mortising, lathe work, boring, bandsawing and jointing. This is followed by sanding. Once these preliminaries are complete the assembly can begin. Work such as sub-assembling, clamping, drawer work and door hanging occur at this point. Finally the finishing stain, filling, sealing and glazing occur before items are ready for packing and shipping.

**Surface decoration and finish**

Again, innovative techniques and application of novel materials have played a large part in the story of decoration and finish in the twentieth century.
The range of finishes has increased enormously over the century. French polish and wax finishes remained popular during the early part of the century but after the First World War they were gradually replaced by nitro-cellulose lacquers. These lacquers, developed from the dopes used on aircraft frames, produced a quick-drying finish that was more resistant than French polish to heat and water. They could also be applied by spray gun. Post-war synthetic lacquers including acid catalysed urea-formaldehyde and melamine-formaldehyde, polyurethane and polyester (all with varying properties) have been developed for special applications. Oiled finishes were popular on teak and rosewood furniture.

The Art Deco period (1910–30) was instrumental in incorporating unusual and exotic materials in furniture decoration and finish. In addition to exotic woods, such as Macassar ebony, burr walnut and amboyna, cabinetmakers incorporated mother-of-pearl, ivory, snake-skin, sharkskin (shagreen or Galuchat), leather, vellum, brass and lacquer into their repertoire of novel materials. There was a revival of Oriental lacquer decoration in the period, particularly with the work of Eileen Grey and Jean Dunand.

In the latter half of the century the use of plastics, apart from lacquers, is most noticeable in laminates and paper foils. Other finishes, popular at various times during the century, include fumed oak (subjecting objects to ammonia fumes), limed oak (slaked lime rubbed into grain leaving white flecks), and for metals, oxidizing, anodizing, and stove enamelling.

The twentieth century is unique in the wide range of opportunities that furniture-makers have had in the making, decoration and finishing of their furniture.

1.7 Conclusion

Like all material objects, the history and background of furniture is a mirror of change in societies. The continuing development of societies in economic, political, cultural and philosophical terms, as well as changes of physical and geographic nature are all reflected in furniture. The understanding of the context of furniture therefore has value far beyond questions of attribution, rarity, value, association or other equally interesting aspects. It is very much part of the material culture of a society. From the meanest stool to the grandest cabinet, all furniture and furnishings are part of the jig-saw that represents particular moments in history.

The careful study of artefacts and their cultural context will enable us to understand a little more of how materials, techniques, tools, trade and consumer usage were understood in their own time. In conjunction with the practical physical analysis and inspection by conservators and historians, other sources of history are needed to develop what can be learnt from the objects themselves. These other sources include, inventories, account books, diaries, journals, design and price books, paintings and drawings as well as aspects of interior design and architecture. The important contributions to be made from other disciplines need to be acknowledged but there is some way to go before they are fully part of the furniture historian's armoury. However, anyone interested in learning more about furniture, those who made and used it, as well as its wider role in various societies will enjoy following the multifarious paths that make up the history of furniture.

Organization of trades and manufacturing

With the vast increase in the choice of materials and methods of making, the role of traditional furniture-makers and retailers has been whittled away. There are still many small businesses in the trade but the turn of the century saw the beginning of a tendency to move towards factory production on a larger scale. This occurred especially in the United States, in centres such as Grand Rapids.

In England a move away from London's East End towards the Lea Valley Trading Estate was exemplified by the Lebus company who at one time had the largest furniture factory in the world. In the second half of the century the trade has become international in its markets. This has been helped greatly by the development of the knock-down (KD) method of construction.

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