many are fed for distant markets, many reared and kept for dairy purposes. The rich grazing tract of the Vale of Berkeley is said to produce annually 1200 tons of the famous double Gloucester cheeses, and the Vale in general has long been celebrated for its cheese and butter. The Vale of Gloucester is the chief corn district. Its aspect is generally pastoral, characterized by grass-lands hemmed in with hedgerows and hedgerow timber, and dotted with apples, pears, and orchard fruit as if to compensate for the comparative barrenness of the Coteswolds. The Vale, from its position and climate, is subject to violent storms of wind and rain.

Statistics of Agriculture for Gloucestershire as returned on 4th of June 1878.

Total area	804,977	acres.
Total acreage under crops, bare fallow, and grass	648,795	,,
Corn crops (nearly one-half wheat and one-fourth barley)	172,515	,,
Green crops (about two-thirds turnips and swedes)	62,679	,,
Grasses under rotation	94,279	,,
Permanent pasturage	307,026	,,
Bare and fallow	12,263	,,
Flax and hops	33	,,

Live Stock.

Horses	25,725
Cattle	107,236
Sheep	416,853
Pigs	69,331

According to the Owners and Heritages Return 1872–73, the county was divided among 37,705 proprietors, holding land whose acreage was 733,640, and whose gross estimated rental was £2,556,543. The estimated extent of commons and waste lands was 7429 acres. Of the owners 76 per cent. possessed less than one acre, and the average value all over was £3, 8s. 11¾d. There were 10 proprietors who possessed upwards of 5000 acres, viz.:—Lord Fitzhardinge, 18,264; Duke of Beaufort, 16,610; Lord Sherborne, 15,773; Earl Bathurst, 9967; Crown Property, 9575; R. S. Holford (Weston Birt), 9332; Thomas W. C. Master (Cirencester), 7226; Earl Eldon (Encomb), 6664; Lord Sudeley (Winchcomb), 6620; Earl Ducie, 5193.

Forest District.—The surface of this district is agreeably undulating to the height of from 120 to 1000 feet, and its sandy peat soil renders it most suitable for the growth of timber, which is the cause of its having been a royal forest from time immemorial. John Evelyn records that the commanders of the Armada had orders not to leave in it a tree standing. In the reign of Charles I. the Forest contained 105,537 trees, and, straitened for money, he granted it to Sir John Wyntour for £10,000, and a fee farm rent of £2000. The grant was cancelled by Cromwell; but at the Restoration only 30,000 were left, and Wyntour, having got another grant, destroyed all but 200 trees fit for navy timber. In 1680 an Act was passed to enclose 11,000 acres and plant with oak and beech for supply of the dockyards; and the present forest, though not containing very many gigantic oaks, has six "walks" covered with timber in various stages of growth. The two finest oaks of the Forest are a headless giant 45 feet in girth just outside the village of Newland, to the left of the road from Coleford to Monmouth, and "Jack of the Yat," with 19 feet of girth, on the right of the roadside from Coleford to Mitcheldean.[1]

[1] The Forest is locally governed by two crown-appointed deputy gavellers to superintend the woods and mines, and four verderers elected by the freeholders, whose office, since the extermination of the deer in 1850, is almost purely honorary. From time immemorial all persons born in the hundred of St Briavel's, who have worked a year and a day in a coal mine, become "free miners," and may work coal in any part of the Forest not previously occupied. At the present time the Forest laws are administered at the Speech-House by the queen's officers and the free miners.

Botany.—The flora of the county, representing that of the two main hydrographical areas of the kingdom and of various geological formations, is extremely rich. Its distinct forms of phanerogams number more than half the British flora. But there is little bog land in the county, and no true sea coast. Hence certain gaps in the list of indigenous plants. There are only some 25 species of ferns; but the rare flowers mentioned below are worthy of note as indigenous.[2] The quantity of mistletoe on the numerous apple trees in the cider orchards of the Vale is another botanical feature of the county, a parasite occurring on other trees also, notably on the Badham Court oak, Sedbury Park, Chepstow, and on the Frampton-on-Severn oak. The elm, used at Bristol for shipbuilding, the willow, and the maple form the chief hedge timber of the Vale, while in the Forest some fine hollies, 6 feet round, are found amongst the oaks. The Spanish chestnut at Tortworth, Piff's elm, Boddington, near Cheltenham, and the Lassington oak are the most notable trees of the county. Mustard was once much cultivated in the Vale, "few houses being without a cannon ball and bowl in which the seeds were bruised" (see Rudge's *General Views of Agriculture of Gloucester*, London, 1807).[3]

Communication and Trade.—Gloucestershire is, in virtue of its two city ports, Bristol and Gloucester, a maritime county. The approach to the first is by the Somerset Avon, to the second by the Severn, or, more strictly, by the Gloucester and Berkeley canal, for which, owing to the dangerous navigation of the Severn, an Act was obtained in 1793, though the works were not completed and opened for traffic till 1827. They consisted of a small tidal basin and lock at Sharpness Point, on the Severn, near Berkeley, connecting the estuary of the river by a ship canal 16 miles long with the city of Gloucester, where there was a suitable discharging dock, and where the canal was again connected with the river Severn by a lock. The gradual extension of the trade necessitated a corresponding extension of the works, and in 1869 a new and enlarged entrance, half a mile further down the river, was projected, with suitable discharging and repairing docks, which last form one large sheet of water on the same level as the old canal connecting them also with Gloucester. These were completed and opened in 1874. Through the river Severn from Gloucester to Worcester and Stourport the port is brought into direct communication with the great system of internal canals throughout the kingdom, and both at Sharpness docks and Gloucester is in direct communication with the Midland and Great Western railway systems. The following are the trade statistics of the year ending September 25, 1878.

	Tons.	Tons.
Foreign imports	428,532	
Coasting	105,224	
		533,756
Foreign exports	51,047	
Coasting	112,176	
		163,223
Total traffic		696,979

Of the foreign imports 253,643 tons, amounting to about 1,200,000 quarters, were grain and seed. The port is well situated for a corn port, its corn warehouses at Sharpness accommodating 100,000 quarters, and those at Gloucester about 130,000 quarters. The new works at Sharpness will accommodate vessels up to 2500 tons burden.

The Severn Bridge railway—5 miles in length—commences at Lydney by a junction with the Great Western Railway and the Severn and Wye railway, crosses the Severn at Purton Passage, and terminates at the Berkeley new docks by a junction with the Midland, thus forming a long-needed connexion between the two sides of the river, and shortening the distances from South Wales to London by 14 miles, and from South Wales to Bristol by 20.

[2] *Anemone Pulsatilla*; *Arabis stricta*; *Thlaspi perfoliatum*; *Hutchinsia petræa*; *Polygala oxyptera* and *calcarea*; *Cerastium pumilum*; *Lotus angustissimus*; *Pyrus pinnatifida*; *Epilobium lanceolatum*; *Sedum rupestre*; *Trinia vulgaris*; *Limnanthemum nymphæoides*; *Veronica hybrida*; *Orobanche Hederæ*; *Cynoglossum montanum*; *Utricularia neglecta*; *Daphne Mezereum*; *Buxus sempervirens*; *Cephalanthera rubra*; *Galanthus nivalis*.

[3] *Authorities.*—Swete's *Flora Bristoliensis*, 1854; Buckman's *Botany of Cheltenham*, 1844; Marshall's *Rural Economy of Gloucestershire*, 1789; H. G. Nicholl's *Forest of Dean*, 1858; and MS. Floras of Gloucestershire, by Messrs Harker and Boulger.

Its great local importance consists in providing a communication from South Wales and Dean Forest and their coal-fields to the Berkeley new docks and the south of England, and is evidenced by the various competing schemes introduced in the same session of 1872 for bridges having the same object. The great iron bridge itself consists of girders constructed on a modification of the bow-string principle, and rests on piers composed of cast iron cylinders sunk down in the rock and filled with concrete. Commencing with the Lydney shore, the spans are as follows:—one of 134 feet, two of 327, five of 171 feet, thirteen of 134, and one of 196 feet (inclusive of swing bridge over canal), making in all 22. The width of the river is 1186 yards, and the total length of the bridge, including the masonry viaduct and swing span, 1387 yards. While the main object of this stupendous undertaking is the transit of coal, arrangements are also contemplated for passenger traffic across the river.

Another canal, once of great importance to the commerce of Gloucestershire, is the Thames and Severn canal, connecting the navigation of these two great rivers, the first of which rises at the back of Leckhampton Hill, at Seven Springs. The Thames and Severn canal begins at Lechlade on the former river, and joining the Stroudwater canal, which crosses the Gloucester and Berkeley, enters the Severn at Framilode. But this canal, though of considerable engineering skill, is now but little used, the Great Western railway having almost entirely superseded it; and it is the same with another canal running from the Severn at Gloucester to Newent and Ledbury.

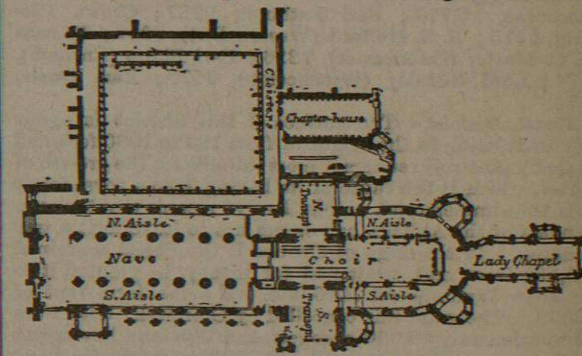
Manufactures.—Gloucestershire is also an important manufacturing county. In the time of Edward III. the manufacture of woollen cloth was introduced into its hill country by the Flemings, attracted probably by the facilities offered for felting by the numerous streams of water flowing from the Coteswolds. The manufacture gradually increased in spite of vexatious legislation, enacted with the view of encouraging native industry, but really tending to hamper the trade. Cirencester is mentioned as its seat in Henry IV.'s reign, and Stroud in 1553. The raw material for the manufacture was long obtained from the produce of English flocks, but afterwards a better description of wool was imported from Spain, and towards the close of the last century a still finer quality was got from Germany. The main supply is now obtained from the British colonies in the southern hemisphere. The description of cloth for which Gloucestershire and the west of England have been and still are most famous is broad-cloth, dressed with teazles to produce a short close nap on the face, and made of all shades of colour, but chiefly black, blue, and scarlet. The most prosperous time of the Gloucestershire woollen trade was from 1800 to 1820, during which period the water-power of the various streams was keenly utilized, and a very large proportion of the population was engaged early and late on the several processes, either in their cottages or at the mills. The commercial crisis of 1825 very seriously crippled the trade; and though it afterwards recovered, it is probable that fewer persons have since been employed in it. The further introduction of machinery, enabling manufacturers to dispense with much manual labour, the passing of the factory laws, and the increased facilities of obtaining education, have greatly improved the social habits of the manufacturing population.

History.—Gloucestershire has not been unnoted in the annals of England. At Gloucester Henry III. was crowned; at Berkeley Castle Edward II. was murdered; the Wars of the Roses were ended at the battle of Tewkesbury, where in May 1471 Queen Margaret and Prince Edward were taken prisoners; the repulse which Charles I. sustained at Gloucester, when the earl of Essex compelled him to raise the siege, was the climax of his fortunes. The county is strewn with relics of antiquity. Four Roman roads intersect it; Roman pavements and vestiges are found at Cirencester, Gloucester, Woodchester, and Lydney, and camps—British, Saxon, Danish, and Roman—in numerous places, with many interesting relics of the Middle Ages. Among these are the restored castle of Sudeley, near Winchcombe, a manor house before the Conquest, a baronial castle in the days of Stephen, and the home in succession of the Botelers, Seymours, Queen Katherine Parr, and the Chandos family; Thornbury Castle, an interesting ruin instead of a castellated palace, as it would have been had not its pretensions provoked the jealousy of Wolsey against its builder, Edward Stafford, duke of Buckingham, who was beheaded in 1521; St Briavel's Castle, to the south of the Forest of Dean, an ancient seat of the Norman kings, if not the Saxon, which became the residence of the chief officer of the Forest, and retains in its ruined state a decorated chimney shaft surmounted by a horn, the warder's badge. Berkeley Castle, built prior to Henry II., is an almost unique specimen of a feudal residence in the actual occupation of a descendant of its founder, Baron Fitzharding. Edward II. was murdered in a detached upper chamber of the square tower. The chief mansions of the county are Badminton House (Duke of Beaufort); Oakley Park, Stroud (Earl Bathurst); Tortworth Park, with a chestnut measuring 52 feet, a boundary tree in King Stephen's reign (Earl Ducie); Sherborne Park, Northleach (Lord Sherborne); Clearwell Court, Coleford (Earl of Dunraven); Highnam Court (T. Gambier Parry); Sudeley Castle (J. Coucher Dent); Southam House, the oldest residential house in the county, built in the time of Henry VII., a timber and stone mansion of two stories (Earl of Ellenborough); and Prinknash Park, a 15th century residence of the abbots of Gloucester (B. St John Ackers). Besides these there are various other seats of somewhat lesser size. Among the eminent persons born in the county are the chronicler Robert of Gloucester, Sebastian Cabot, William Cartwright the poet, Thomas Chatterton, Robert Southey, the Rev. John Eagles, and George Whitfield.

Education.—According to the parliamentary returns of public elementary schools for the year ending 31st August 1876, there were in Gloucestershire 408 day schools, 34 of which were also used as night schools. Of these schools 314 were in connexion with the Church of England, or the National Society or parochial; 15 were board schools, 9 Roman Catholic, 36 British and Foreign, and 13 Wesleyan Methodist Conference schools.

See Atkyns's *Gloucestershire*, 1769; Rudder's *Gloucestershire*, a republication of Atkyns, with additions, 1779; Fosbrooke's *Abstract of Records and Manuscripts respecting the County of Gloucester*, 1807, 2 vols. 4to; *The Forest of Dean, an Historical and Descriptive Account*, by H. G. Nicholls, M.A., 1858.

GLOUCESTER, the capital city of the county named after it, 106 miles from London by road and 114 by railway, derives its name from the British Caer-Gloui, near which at Kingsholm the Romans formed their camp of Glevum, vestiges of which remain in four principal streets running N., S., E., and W., and crossing at the centre, as well as in Roman pavements, altars, coins, and pottery. A Roman station under Aulus Plautius, it became a city of Mercia, by name Gleauanceastre, under the Saxons, and is named by Bede as one of the noblest cities in the land. A monastery was founded here in 679, in which in 1022 Bishop Wulstan of Worcester established the Benedictine rule. In the 8th century the city was repeatedly ravaged and burnt by the Danish invaders, and endured ruinous conflicts up to the time of the settlement between Canute and Edmund Ironside. The abbey throve from the time of Canute, the foundations of the present church having been laid by



Gloucester Cathedral.

Abbot Serlo (1072–1104), and Walter Frocester, its historian, becoming its first mitred abbot in 1381. Edward the Confessor often resided at Gloucester, and it was a favourite resort of the Norman kings, of whom Henry I. met with his death from a surfeit of lampreys, for which he acquired a taste there. Henry II. held a great council there, and Henry III. was crowned in the abbey, and "loved Gloucester better than London." The "statutes of Gloucester" were passed in parliaments held there in succeeding reigns; but the tide of royal favour experienced an ebb when Charles I. subjected the city, garrisoned by the Parliamentarians, to a critical siege, which was eventually raised in September 1643 by the earl of Essex. Until 1541 the whole of Gloucestershire lay in Worcester diocese, but in that year it was constituted the see of Gloucester, with the abbey church for its cathedral, and John Wakeman, last abbot of Tewkesbury, for its first bishop. The cathedral may be succinctly described as "a Norman carcase," altered by additions in every style of Gothic architecture. It is 420 feet long, and 144 broad, with a beautiful central tower rising to the height of 225 feet, and topped by four graceful pinnacles. The nave is massive Norman with Early English roof; the crypt also, under the choir, aisles, and chapels, is Norman, as is also the chapter house. The south porch is Perpendicular, with fan-tracery roof, as also is the north transept, the south being transitional Decorated. The choir has Perpendicular tracery and an apsidal chapel on each side, and the triforium carried under the east window in a curve, so as to form a whispering gallery, is very noteworthy. Between the apsidal chapels is a cross lady-chapel, and north of the nave are the cloisters with very early example of fan-tracery, the carols or stalls for the monks' study and writing lying to the south. The beautiful tower is 15th century work. For several years an extensive process of restoration has been in progress. The finest monument is the canopied shrine of Edward II., who was brought hither from Berkeley. By the visits of pilgrims to this the building and sanctuary were enriched. At the step of the altar, too, is a monument in coloured bog oak of Robert Curthose, a great benefactor to the cathedral, the eldest son of the Conqueror, who was interred there; and those of Bishop Warburton and Dr Edward Jenner are also worthy of special mention. One of the oldest houses in the city is the "New Inn in the Northgate Street," a strong and massive timbered house with external galleries and court yards, built in 1450 for the pilgrims to Edward II.'s shrine, by Abbot Sebroke, a traditional subterranean passage leading thence to the cathedral. The timber is principally chestnut.

Plan of Gloucester.

1. St Mark's Church.
2. Ruins of St Catherine's Abbey.
3. St Bartholomew Hospital.
4. St Mary de Lode Church and Hooper's Monument.
5. Statue of Queen Anne.
6. St Nicholas Church.
7. Gas Works.
8. County Hall.
9. Theatre.
10. St John's Church.
11. Wesleyan Chapel.
12. New Hospitals.
13. Blue Coat School.
14. St Michael's Church.
15. Post Office.
16. Corn Exchange.
17. Meat and Vegetable Market.
18. St Mary de Crypt.
19. County Gaol.
20. Custom House.
21. City Gaol.
22. St Luke's Church.

Gloucester is situated on a gentle eminence overlooking the Severn, and sheltered by the Coteswolds on the east, while the Malverns rise prominently to the west. The Tolsey or Guildhall stands at the cross, the point of intersection of the four principal streets, in each of which are various quaintly gabled and timbered houses, helping to preserve the ancient aspect of the city. The most modern quarter of it is in the region of the spa, to the south, where a chalybeate spring was discovered in 1814. The principal public buildings are the shire hall, the town hall or Tolsey (occupying the site of the ancient Roman capitol), the county gaol and penitentiary, the East-gate market, the corn market, the infirmary, the lunatic asylum, and the hospital erected in 1861 in place of the four old almshouses. There are 14 churches and several dissenting chapels, and it may have been the olden proverb, "as sure as God's in Gloucester," which provoked Oliver Cromwell to declare that the city had "more churches than godliness." Of the churches four are of special interest: St Mary de Lode, which is very old, and contains a monument of Bishop Hooper; St Mary de Crypt, a cruciform structure of the 12th century, with a beautiful and lofty tower; the church of St Michael, said to have been connected with the ancient abbey of St Peter, and from whose tower the curfew bell is still rung every evening; and St Nicholas church, originally of Norman erection, and possessing a tower and other portions of later date. A new episcopal palace was erected in 1862. There are three endowed schools: the College school, founded by Henry VIII., as part of the cathedral establishment; the Crypt school, founded by Dame Joan Cooke in the same reign; and Sir Thomas Rich's Blue Coat Hospital for 30 boys (1666). The first Sunday school was held in Gloucester, being originated by the Rev. Richard Raikes. Gloucester has returned two members to parliament since the 23d year of Edward I. The city was chartered by Richard III., and is now governed by a mayor, six aldermen, and eighteen burgesses. Its ancient industries were iron-founding, cloth-making, pin-making, and bell-founding, but the last two have been for some time discontinued. It now possesses iron and brass foundries, marble and slate works, chemical works, soap works, rope works, flour mills, manufactories of engines, machines, and agricultural instruments, and boat and ship-building yards. In 1877 the number of British ships that entered the port was 3762, with a tonnage of 272,391, and of foreign ships 549, with a tonnage of 167,200; the number of British ships that cleared was 3992, with a tonnage of 278,773, and of foreign ships 488, with a tonnage of 144,581. The principal imports are timber, corn, wine, and spirits, and the principal exports iron, coals, malt, salt, bricks, and pottery. The town is celebrated for its Severn salmon and lampreys. Near the canals and docks are the remains (a gateway and some walls) of Llanthony Priory, a cell of the mother abbey in the vale of Ewyas, Monmouthshire, which in the reign of Edward IV. had become the secondary establishment. The famous bore of the Severn attains its great height just below Gloucester. The area of the municipal borough is 415 acres, and of the parliamentary borough 1606 acres. The population of the municipal and parliamentary borough in 1861 was 16,512; that of the municipal borough in 1871 was 18,330, and of the parliamentary borough (extended since 1861) 31,804.

See *Handbook to the Cathedrals of England, Western Division*, 1864; *General Architectural Description of the Cathedral Church at Gloucester, with Plans and Sketches*, by Frederick S. Waller, F.R.I.B.A., 1856. (J. DA.)

GLOUCESTER, a city and port of entry of Essex county, Massachusetts, United States, is beautifully situated near the southern extremity of the peninsula of Cape Ann, 30 miles N.N.E. of Boston by rail. It includes six villages—Gloucester village, East Gloucester, West Gloucester, Annisquam, Bay View, and Lanesville. The harbour, opening out into Massachusetts bay, is one of the best on the coast, and is defended by a fort. The prosperity of Gloucester depends mainly on its cod and mackerel fisheries, which employ nearly 400 vessels, with upwards of 3500 men, and have an annual value of about 4,000,000 dollars. For the year ending June 30, 1878, the total value of im-

ports was 81,450 dollars, of domestic exports 36,172 dollars, and of foreign exports 384 dollars. Steamers ply daily between the city and Boston. There are a number of manufactories connected chiefly with the fisheries, and in the neighbourhood there are extensive granite quarries. Gloucester possesses a fine city hall, a high school, seven grammar schools, and a free library. On account of its attractive situation, and the fine scenery of the neighbourhood, it is a favourite summer residence. About 2 miles from it is Norman's Woe, the scene of the wreck of the "Hesperus," celebrated in Longfellow's poem.

Gloucester received its name from the fact that many of its early settlers came from the county of Gloucester in England. It was occupied as a fishing station in 1624, was incorporated as a town in 1642, and was made a city in 1874. It was attacked by the English in 1775 and in 1814, in both cases unsuccessfully. The population in 1800 was 5313; in 1850, 7786; in 1860, 10,904; and in 1870, 15,389, of whom 4007 were foreigners.

GLOUCESTER, ROBERT OF. See ROBERT OF GLOUCESTER.

GLOVE (Saxon *glof*), a covering for the hand, with a separate sheath for each finger. Among our ancestors, to throw down the glove or gauntlet was equivalent to a challenge to single combat, and the person thus defied signified his acceptance of the challenge by taking up the glove, and casting down his own,—which ceremony was regarded as a mutual compact to meet at the time and place specified. This custom, according to Favyn (*Théâtre d'Honneur et de Chevalerie*), was derived from the Oriental mode of contracting sales of land and the like by giving the purchaser a glove, by way of delivery or investiture; and to this effect he quotes Ruth iv. 7 and Psa. cviii. 9, passages where the word commonly translated "shoe" is by some rendered "glove." Du Cange quotes from a charter of the 13th century an instance of re-investiture or restitution symbolized by the person depositing his glove on the earth. The use of gloves is of high antiquity. There is reason to believe the ancient Persians wore them, since it is mentioned in the *Cyropædia* of Xenophon that on one occasion Cyrus went without his gloves; and we know that some kind of protecting coverings for the hands were used by the Greeks and Romans in certain kinds of manual labour, although their precise form is unknown.

The word *gantus*, used for a glove in mediæval Latin, is obviously of Teutonic derivation. In the life of St Columbanus, written by Jonas, abbot of Bobbio, in the 7th century, gloves for protecting the hands in manual labour are spoken of as "tegumenta manuum quæ Galli *wantos* vocant." A pair of gloves are mentioned in the will of Bishop Riculfus, who died 915 A.D. Gloves did not become articles of ecclesiastical vestment till the 12th century. They do not appear in the Bayeux tapestry, and they did not come into general use in England till the 13th century. Matthew Paris, noticing the burial of Henry II. (1189), mentions that he was buried in his coronation robes, with a golden crown on his head and gloves on his hands. Gloves were also found on the hands of King John when his tomb was opened in 1797, and on the hands of Edward I. when his tomb was opened in 1774. In the 14th century they were in common use among the better classes. In the 16th century they were frequently embroidered with great elaboration, and in the reign of Charles II. the short sleeves of the ladies' dresses brought in long gloves reaching almost to the elbow. It is an old custom in England that a pair of gloves are given by the sheriff to the judge who presides at a maiden assize; and in Scotland white gloves are given to the judges on a maiden circuit,—that is, when there are no cases for trial.

The manufacture of gloves was early introduced into the British Islands, and such was the dignity of the craft that, as early as the reign of King Robert III., the incorporation of glovers of Perth was chartered—a wealthy guild still existing, although the calling has long ceased to characterize that town. The glovers' company of London received armorial bearings as early as 1464, but the body was not chartered till 1638; and in Worcester, which has long been the principal British centre of the trade, a company was incorporated in 1661.

The glove industry of the present day is both extensive and diversified, seeing that gloves are now almost universally worn, and made of various classes of material and in several different ways. Of yarn, thread, silk, and cloth gloves it is unnecessary to speak, as these varieties are, in comparison with leather gloves, of comparatively little importance. The leather employed by glovers is prepared from the skins of deer, sheep and lambs, goats and kids—the last being by far the most important. The skins are prepared either by the ordinary processes of shamoying for wash-leather and doe or buck leather gloves, or by a special method of tawing in the case of ordinary dress gloves. The kid-skins are principally collected by hawkers in the South European countries, and sold in the Leipsic and Naples fairs. The tawing industry is conducted on a great scale at Annonay, Paris, and Milhau in France. The tawing process differs from ordinary tanning in the greater care and cleanliness of all the operations, in the submission of the dressed skins to a brief fermentation by piling them under the influence of heat, which increases the softness and flexibility of the leather, and in tawing with a mixture of flour, the yellow of eggs, and alum. On the completion of this operation, they are stretched by hand and dried as rapidly as possible. Thereafter they are damped, placed in dozens between linen cloths, and worked about to render them soft and pliable, after which they are planed on the flesh side, dried, and again planed. They are then polished by rubbing with a heavy glass disc or other smooth substance, and dyed by brushing liquid dyes over one side. Finally they are stretched on a marble table, and smoothed with a blunt knife. From a kid skin so prepared the materials of three gloves are obtained. The skins are moistened and stretched, and the various parts are cut out by a machine having steel punches the shape and size desired. The thumb piece, the quirks and the fourchettes inserted between the fingers, and the wrist welt—the latter frequently white—are cut out separately. Machine sewing, in which a kind of button stitch is made, is to a small extent utilized in the manufacture of gloves; but the greater part of the sewing is done by hand. The pieces to be sewn together are placed in a machine between a pair of jaws, the holding edge of which is composed of fine saw teeth, between each of which the sewer passes back and forward her needle, and in this way a neat uniform stitch is secured. There are three kinds of hand-sewing in the glove trade—round sewing or ordinary glove stitch, piqué stitch, and prick seam. After sewing, the backs are stitched or tamboured, the button-hole is formed, the wrist attached, and the button sewed on, thus finishing the glove. After damping and stretching to its utmost length, the glove is ready to be stamped and put up for use.

Paris is, beyond question, the most important centre of glove-making, and for delicacy of material and beauty of workmanship the productions of some Parisian manufacturers are without any rivals; but it is at Grenoble that French gloves are most extensively manufactured. English gloves, of unfailing excellence of material and workmanship, are principally made at Worcester; and in one specialty—"dogskin" gloves made from Cape sheep-skin, having a warm tan colour—English makers have no competitors. A very large quantity of cheap but useful gloves are made at Brussels and Copenhagen. During the year 1876, 1,084,400 dozen pairs, of a value of £1,380,884, were imported into

the United Kingdom from France; from Belgium there were 301,305 dozen pairs, valued at £345,174; and the total imports from all quarters amounted to 1,497,437 dozen pairs, of a value of £1,840,956. In 1878 the total imports were 1,060,040 dozen pairs, valued at £1,302,060.

Buckskin gloves are largely made in the United States, and that branch, together with a limited production of kid and other gloves, is chiefly centred in the village of Gloversville, Fulton co., N.Y. It is estimated that from about 140 separate glove factories in that village not less than two-thirds of the gloves made in the United States are sent out. Kid gloves are made to some extent in New York city.

GLOVER, RICHARD (1712–1785), an English poet, was born in 1712. He was the son of a London merchant, and received his education at Cheam in Surrey. While there he wrote in his sixteenth year a poem to the memory of Sir Isaac Newton, which was appended by Dr Pemberton to his *View of Newton's Philosophy*, published in 1728. Though Glover followed the business of his father, he devoted much of his attention to literary pursuits, and he acquired the reputation of being one of the best Greek scholars and most famous poets of his day. In 1737 he published an epic poem, *Leonidas*, written in celebration of the defence of Thermopylæ. As the praise of liberty formed the subject matter of the poem, it was thought to have a special reference to the politics of the time; and being warmly commended by the regent and his court, by Lord Lyttelton, and the novelist Fielding, it soon passed through several editions. Though exhibiting a well-cultivated taste and some skill in versification, it possesses, however, little poetical merit, and is totally wanting in the higher qualities of epic poetry. A continuation of the *Leonidas*, entitled *Atheniad*, subsequently appeared, but had little or no popularity. In 1739 Glover published a poem entitled *London, or the Progress of Commerce*; and in the same year, with a view to excite the nation against the Spaniards, he wrote a ballad, *Hosier's Ghost*, which is spirited and effective, and was one of the most popular of its day. He was also the author of two tragedies, *Boadicea* (1753) and *Medea* (1761), which, however, on account of their close imitation of Greek models, are unsuited for the modern stage. The success of Glover's *Leonidas* led him to take considerable interest in politics, and in 1760 he entered parliament as member for Weymouth, in which capacity his abilities as a speaker, and his knowledge of commercial questions, acquired for him considerable influence. He died in November 1785. His diary, entitled *Memoirs of a distinguished literary and political Character from* 1742 to 1757, was published in 1813. Glover is one of the reputed authors of *Junius*; but his claims—which were advocated in an *Inquiry concerning the author of the Letters of Junius, with reference to the Memoirs, &c.*, published in 1815—rest on very slight grounds.

GLOWWORM. See COLEOPTERA, vol. vi. p. 132.

GLUCINUM, or BERYLLIUM (Greek γλυκύς, sweet, from the taste of its salts), is a metal related most nearly in its physical properties to zinc and mercury, symbol G, atomic weight 9·3. It occurs in the beryl and emerald, $G_3Al_2Si_6O_{18}$, or $3GO,Al_2O_3,6SiO_2$ (see vol. iii. p. 613, and vol. viii. p. 170), from which its oxide was earliest obtained by Vauquelin in 1798; also in the minerals euclase ($H_2G_2Al_2Si_2O_{10}$, or $H_2O,2GO,Al_2O_3,2SiO_2$), phenacite (G_2SiO_4), chrysoberyl (GO,Al_2O_3), gadolinite, leucophanite, and helvite. Glucinum was first obtained by Wöhler and Bussy in 1828, in an impure pulverulent form, by the fusion of its chloride with potassium; and by Debray in 1854, in the compact state, by the decomposition in an atmosphere of hydrogen of the vapour of the chloride by that of sodium (*Ann. Chim. Phys.*, ser. iii. vol. xliv. 5). Heated in air the metal oxidizes superficially, or, if in a state of fine division, burns with brilliancy. The spark-spectrum of glucinum presents two brilliant blue lines. Glucinum may be estimated in minerals, after removal of their silica, in the insoluble form or as fluoride, by the separation of aluminium mostly as alum, what remains being then thrown down, with iron, by means of warm solution of ammonium carbonate; to the filtrate excess of hydrochloric acid is added; and finally the glucinum is precipitated as hydrate, $G(OH)_2$, which is washed, dried, and ignited. An alloy of glucinum with iron has been obtained by Davy and by Stromeyer.

On the chemistry of glucinum see further vol. v. pp. 526–8 and 543; also Watts, *Dict. of Chemistry*, ii.; W. Crookes, *Select Methods in Chemical Analysis*, pp. 45, 46, 66; and Roscoe and Schorlemmer, *Treatise on Chemistry*, ii. pt. 1, pp. 231–6.

GLUCK (not, as frequently spelt, GLÜCK), CHRISTOPHER WILLIBALD (1714–1787), a celebrated operatic composer, was born at Heidenwang, near Neumarkt, in the Upper Palatinate, on July 2, 1714. He belonged to the lower middle class, his father being gamekeeper to Prince Lobkowitz; but the boy's education was not neglected on that account. From his twelfth to his eighteenth year he frequented the Jesuit school of Kommotow in the neighbourhood of Prince Lobkowitz's estate in Bohemia, where he not only received a good general education, but also had lessons in music. At the age of eighteen Gluck went to Prague, where he continued his musical studies under Czernhorsky, and maintained himself by the exercise of his art, sometimes in the very humble capacity of fiddler at village fairs and dances. Through the introduction of Prince Lobkowitz, however, he soon gained access to the best families of the Austrian nobility, and when in 1736 he proceeded to Vienna, he was hospitably received at his protector's palace. Here he met Prince Melzi, an ardent lover of music, who invited Gluck to accompany him to Milan, where the young musician continued his education under Giovanni Battista San Martini, an interesting composer who, although self-taught, was one of the most accomplished musicians of the 18th century, and has been called the model of Haydn. His works belong chiefly to the class of chamber music. In this respect, however, the master's example was not followed by the pupil. Gluck's dramatic instinct was irrepressible, and soon we find him producing operas at the rapid rate necessitated by the omnivorous taste of the Italian public in those days. Eight of these works were produced at various Italian theatres between 1741 and 1745. Although favourably received, they were not much above the ordinary operatic level of the day, and it would be needless even to give their names. Only the first may be mentioned here, *Artaserse*, libretto by Metastasio, first performed at Milan in 1741. To the reputation thus acquired Gluck owed an invitation to London, where in 1745 he became composer for the opera house in the Haymarket. The first opera produced there was called *La Caduta dei Giganti* (1746, words by Metastasio), followed by one of his earlier operas, re-written for the purpose. It is stated that he also appeared as a performer on the musical glasses. The success of the two operas, as well as that of a so-called *pasticcio*, or dramatic medley entitled *Piramo e Tisbe*, was anything but brilliant, and Gluck accordingly left London. But his stay in England, although not accompanied by immediate success, was not without important consequences for his subsequent career. Gluck at this time was neither more nor less than an ordinary producer of Italian opera. Handel's well-known saying that Gluck knew no more counterpoint than his (Handel's) cook, whether true or not, was unfair, for the reason that, if Gluck had known as much counterpoint as the author of *Israel in Egypt* himself, it would have been difficult to make use of it in the style of music