

sutures of the carpels, where the spines arch a little, it is found to contain five oval cells, each filled with a cream-coloured, glutinous, smooth pulp, in which are imbedded from one to five seeds about the size of chestnuts. The pulp and the seeds, which latter are eaten roasted, are the edible parts of the fruit. With regard to the taste of the pulp Mr Wallace remarks, "A rich butter-like custard, highly flavoured with almonds, gives the best idea of it, but intermingled with it come wafts of flavour that call to mind cream-cheese, onion-sauce, brown sherry, and other incongruities; . . . it is neither acid, nor sweet, nor juicy, yet one feels the want of none of these qualities, for it is perfect as it is." The fruit, especially when not fresh from the tree, has, notwithstanding, a most offensive smell, which has been compared to that of rotten onions or of putrid animal matter. The Dyaks of the Sarawak river in Borneo esteem the durian above all other fruit, eat it unripe both cooked and raw, and salt the pulp for use as a relish with rice.

See Linschoten, *Discours of Voyages*, bk. i., chap. 57, p. 102, fol. Lond. 1598; Bickmore, *Travels in the East Indian Archipelago*, p. 91, 1868; Wallace, *The Malay Archipelago*, 3rd. ed. 1872.

DÜRKHEIM, a town in the Palatinate of the Rhine, near the foot of the Hardt Mountain, and at the entrance of the valley of the Isenach, 15 miles north-west of Spire, on the railway between Monsheim and Neustadt. Besides being the seat of various administrative offices, it possesses three churches and a synagogue, a town-hall occupying the site of the castle of the princes of Leiningen-Hartenburg, an antiquarian and a scientific society, a public library, and a high school. It is well known as a resort for invalids, who may either indulge in the grape-cure or have recourse to the salt-springs of Philippsahl in the neighbourhood, which not only supply the bathing establishment, but produce annually about 8000 cwt. of marketable salt. The inhabitants have a good trade in wine, and manufacture oil, tobacco, glass, and paper.

As a dependency of the Benedictine abbey of Limburg, which was built and endowed by Conrad II., Dürkheim or Thurnheim came into the possession of the counts of Leiningen, who in the 13th century made it the seat of a fortress, and in the 14th inclosed it with wall and ditch. In the three following centuries it had its full share of the military vicissitudes of the Palatinate; but it was rebuilt after the French invasion of 1689, and greatly fostered by its counts in the beginning of next century. In 1794 its new castle was sacked by the French, and in 1849 it was the scene of a contest between the Prussians and the insurrectionists. The ruins of the abbey of Limburg are still to be seen about a mile S.W. of the town; and in the neighbourhood rises the Kastanienberg, with the ancient rude stone fortification of the Heidenmauer or Heathen's Wall. Population in 1871, 5572.

DURLACH, a town of Baden, in the circle of Karlsruhe, 2½ miles by rail from the city of that name, with which it is connected by a canal and an avenue of poplars. It lies on the left bank of the Pfalz, at the foot of the vineyard-covered Thurmberg, which is crowned by a watch-tower; and it possesses a castle erected in 1565 and now used as barracks, an ancient Rathhaus, a church with an excellent organ, an upper Bürgerschule, an orphan asylum, and in the market-place a statue of the margrave Charles II. Its inhabitants manufacture tobacco, beer, vinegar, and chicory, and engage in agriculture and gardening. A chalybeate spring is utilized at the bathing establishment of Amalienbad.

Durlach was bestowed by the emperor Frederick on Hermann V. of Zaringen as an allodial possession, but afterwards came into the hands of Rudolf of Hapsburg. It was chosen as his residence by the margrave Charles II., in 1565, and retained this distinction by the foundation of Karlsruhe in 1715, though it was almost destroyed by the French in 1688. In 1846 it was the seat of a congress of the liberal party of the Baden parliament; and in 1849 it was the scene of an encounter between the Prussians and the insurgents. Reichenbach the mechanic and Posselt the historian are natives of the town.

DURRA, or **INDIAN MILLET**, *Sorghum vulgare*, is a species of grass of the tribe *Andropogoneæ*. The terms *durra* and *surrut* are applied to the plant in Arabia; in India it is known as *jawari* (Hindustani), *jowari* (Bengali), *cholum* (Tamil), and *jonna* (Telugu), and in the West Indies as Negro or Guinea Corn. It is a strong grass, growing to a height of from 4 to 8 or even 16 feet; the leaves are sheathing, solitary, and about 2 inches broad and 2½ feet in length; the panicles are contracted, dense, and hermaphrodite; and the seeds, which are inclosed in husks, and protected by awns, are round, hard, smooth, shining, brownish-red, and somewhat larger than mustard seeds. The plant is cultivated in various parts of India and other countries of Asia, in the United States, and in the south of Europe. Its culms and leaves afford excellent fodder for cattle; and the grain, of which the yield in favourable situations is upwards of a hundredfold, is used for the same purposes as maize, rice, corn, and other cereals. Allied species are *S. bicolor*, much valued in India as a forage-plant, and *S. saccharatum*, commonly called sorghum or Chinese sugar cane, which is extensively cultivated in China, North India, and Africa. The latter species is grown in America chiefly for the manufacture of molasses from its juice, and in France as a source of alcohol. The total quantity of sorghum molasses made in the United States in 1870 has been estimated at 16,050,089 gallons.

DUSSEK, JOHANN LUDWIG (1761–1812), pianist and composer, was born at Czeslau, in Bohemia, on the 9th February 1761. His father, Johann Joseph Dussek, a musician of high reputation, was organist and choir-master in the collegiate church of Czeslau, and several other members of the family were distinguished as organists. He had thus the most favourable opportunity for the development of the musical talent which he displayed almost from infancy. Under the careful instruction of his father he made such rapid progress that he appeared in public as a pianist at the age of six. A year or two later he was placed as a choir boy at the convent of Iglau, and he obtained his first instruction in counterpoint from Spenar, the choir-master. When his voice broke he entered on a course of general study, first at the Jesuits' college, and then at the university of Prague, where he took his bachelor's degree in philosophy. During his curriculum of two and a half years he had paid unremitting attention to the practice and study of his art, and had received farther instruction in composition from a Benedictine monk. In 1779 he was for a short time organist in the church of St Rombaut at Mecklin. At the close of this engagement he proceeded to Holland, where he attained great distinction as a pianist, and was employed by the stadtholder as musical instructor to his family. While at the Hague he published his first works in the form of several sonatas and concertos for the piano. He had already composed at the age of thirteen a solemn mass and several small oratorios, which still exist in manuscript. In 1783 he visited Hamburg, and placed himself under the instruction of Emmanuel Bach. Though he believed himself to have derived great benefit from this, it may be questioned whether his genius was not fettered rather than stimulated by the enthusiastic veneration with which he regarded his model. From Hamburg he proceeded to Berlin, where his powers as a pianist met with their accustomed recognition. After spending two years in Lithuania in the service of Prince Radziwill, he went in 1786 to Paris, where he remained, with the exception of a short period spent at Milan, until the outbreak of the Revolution, enjoying the special patronage of Marie Antoinette and great popularity with the public. Towards the close of 1789 he removed to London, where three years later he married a daughter of Dominico Corri, who was

herself a clever harpist and pianist. In London he obtained his greatest success alike as composer, performer, and teacher. Unfortunately, however, he was tempted by the large sale of his numerous compositions to open a music-publishing warehouse in partnership with Montague Corri, a relative of his wife. The result was injurious to his fame and disastrous to his fortune. Writing solely for the sake of sale, he composed many pieces that were quite unworthy of his genius: and, as he was entirely destitute of business capacity, bankruptcy was inevitable. In 1800 he was obliged to flee to Hamburg to escape the claims of his creditors. Some years later he was attached in the capacity of musician to the household of Prince Louis Ferdinand of Prussia, with whom he formed an intimate friendship. On the death of his patron in 1806 he passed into the service of Prince Ysenburg as court musician. In 1809 he went to Paris to fill a similar situation in the household of Prince Talleyrand, which he held until his death in March 1812. Dussek had an important influence on the development of pianoforte music. As a performer he was distinguished by the purity of his tone, the combined power and delicacy of his touch, and the facility of his execution. As a composer he possessed a distinct individuality of style, and, while much that he wrote has little value, his best works rank high among pianoforte classics. His sonatas known as *The Invocation*, *The Farewell*, and *The Harmonic Elegy*, though not equally sustained throughout, contain movements that have scarcely been surpassed for solemnity and beauty of idea. Two operas, which he composed during his residence in London, were failures.

DÜSSELDORF, a town of Prussia, at the head of a government in the province of the Rhine, on the right



Plan of Düsseldorf.

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|-------------------------|----------------------------|
| 1. Ursula Church | 9. Town Hall |
| 2. Government Buildings | 10. Elector Wilhelm Statue |
| 3. Court Church | 11. Theatre |
| 4. St Lambert's Church | 12. Court of Justice |
| 5. School of Art | 13. Gymnasium |
| 6. Mint | 14. Maximilian Church |
| 7. Hauptwache | 15. Garrison Church |
| 8. Old Castle | 16. Post Office |

bank of the river, 25 miles below Cologne. It is divided

into four portions,—the Old Town, the Karlstadt, which dates from 1787 and is called after the electoral prince Charles Theodore, the New Town, which was in process of formation from 1690 to 1716, and the Friedrichsstadt, laid out within recent years. New streets are rapidly stretching out in all directions, and the villages of Pempelfort, Bilk, and Derendorf are already almost incorporated. Within the area of the town proper there are numerous open grounds and public squares, which prevent the regularity of its plan degenerating into monotony: the market-place, with the colossal bronze statue of the electoral prince Johann Wilhelm, the parade, the Allée Strasse, the King's Alley, and the King's Platz may be specially mentioned. Of the ten churches the most noticeable are—St Andrew's, formerly the Jesuit or court church, with frescoes by Hübner, Deger, and Mücke, and the embalmed bodies of several of the electors; St Lambert's, with a tower 180 feet high, and containing monuments in honour of Duke William IV. and Voetius; and Maximilian's, with frescoes by Settegast and others. Besides the old ducal palace, laid in ruins by the French in 1794, but restored in 1846, the secular buildings comprise the former Jesuit college, now occupied by the administrative offices, a town-house dating from 1567, a penitentiary, a lunatic asylum, several hospitals and infirmaries, a theatre completed in 1875, a music hall, a gymnasium, and a polytechnical school. The town also possesses a library of 50,000 volumes, and is the seat of a great number of commercial and intellectual associations; but to nothing is it more indebted for its celebrity than to the Academy of Painting. This famous institution, originally founded by the electoral prince Charles Theodore in 1767, was reorganized by King Frederick William in 1822, and has since attained a high degree of prosperity as a centre of artistic culture. From 1822 till 1826 it was under the direction of Cornelius, a native of the town, from 1826 to 1859 under Schadow, and from 1859 to 1864 under Bendemann. From Bendemann's resignation it continued in the hands of a body of curators till 1873, when Wiscelinus of Weimar was chosen director. The noble collection of paintings which formerly adorned the Düsseldorf gallery was removed to Munich in 1805, and has not since been restored; but there is no lack of artistic treasures in the town. The academy possesses 14,000 original drawings and sketches by the great masters, 24,000 engravings, and 248 water-colour copies of Italian originals; the municipal gallery contains valuable specimens of the local school; and the same is the case with the Schulte collection. The principal names are Cornelius, Lessing, Achenbach, Baur, Tidemann, and Knaus. An annual exhibition is held under the auspices of the Art Union; and the members of the Artist's Society, or *Malkasten*, as they are called, annually celebrate festivities and masquerades of a remarkable description. Not only is Düsseldorf situated in the greatest manufacturing province of Prussia, but it is itself the seat of various important industries,—cotton and carpet weaving, iron-founding, wire-drawing, sugar-refining, brewing, distillation, and the making of pianos and carriages. The surrounding country is largely devoted to market-gardening, and the Düsseldorf mustard is in special repute. A very extensive trade is carried on both by river and by rail; the port was declared free in 1829, and is consequently one of the most frequented on the Rhine. The Düsseldorf Steam-boat Company maintains regular communication with Mayence on the one hand and Rotterdam on the other. A little to the north of the town lies the village of Düsseldorf, with Count Recke Volmarstein's establishment for homeless children in the former Trappist monastery; and in the suburban village of Pempelfort is the *Jägerhof*, the residence at one time of

Prince Frederick of Prussia, and afterwards of the prince of Hohenzollern Sigmaringen. In 1780 the number of inhabitants was about 8000; by 1831 it was over 23,000. The census of 1861 gave 41,290 (of which 3376 were military); that of 1871, 69,348.

Düsseldorf, as the form of the name—the village on the Düsseldorf—clearly indicates, was long a place of small consideration. In 1288 it was raised to the rank of a town by Count Adolf of Berg; from his successors it obtained various privileges, and in 1385 was chosen as their residence. After it had suffered greatly in the Thirty Years' War and the war of the Spanish succession, it recovered its prosperity under the patronage of the electoral prince John William of the Palatinate, who dwelt in the castle till the restoration of Heidelberg. In 1794 the town was violently bombarded by the French; and after the peace of Luneville it was deprived of its fortifications. In 1805 it became the capital of the Napoleonic duchy of Berg; and in 1815 it passed with the duchy into Prussian possession. Among its celebrities are George and Friedrich Heinrich Jakobi, Schenk, Heine, Varnhagen, Cornelius, Camphausen, and H. von Sybel.

DUTENS, LOUIS (1730–1812), a French writer of some celebrity, was born at Tours, of Protestant parents, January 15, 1730. In his youth he devoted himself to poetry; and in 1748 he composed a tragedy, entitled *The Return of Ulysses to Ithaca*, which failed in Paris, but was represented with great applause at Orleans. The author, however, soon became sensible of the faults of his work, and abandoned a species of composition in which he found he was not destined to excel. He soon afterwards went to England with an introduction to Pitt, which he had received from a sister of the statesman. His first residence in London was brief, but he soon returned and obtained a situation as tutor in a private family. The father of the pupil was a man of considerable literary and scientific attainments, who instructed him in those branches of knowledge in which he was deficient. In this manner he learnt Greek and mathematics, and studied the Oriental languages, and Italian and Spanish. Soon after the termination of this engagement he was appointed chaplain and secretary to Mr Mackenzie, the English minister at the court of Turin, and left England in October 1758. In 1760, when Mr Mackenzie returned to England, the secretary remained at Turin as chargé d'affaires, until 1762, when he returned to England and attached himself to the family of Lord Bute, who, before retiring from office in 1763, procured him a pension. He again went to Turin as chargé d'affaires; and during this second mission he undertook the task of collecting and publishing a complete edition of the works of Leibnitz (Geneva, 6 vols. 1769) and wrote his work on the *Discoveries of the Ancients*. On again returning to England he attached himself to the duke of Northumberland, who procured him the living of Elsdon, in Northumberland. He accompanied the duke's son, Lord Algernon Percy, in his travels through France, Italy, Germany, and Holland; and while at Paris he was chosen a member of the Academy of Inscriptions, in 1775. In the same year he was made a fellow of the Royal Society. In 1776 he returned to England, and soon afterwards accompanied Mr Mackenzie and his wife on a tour to Naples. On his return Dutens was invited by Lord Mountstuart, who had been appointed envoy extraordinary, to accompany him to Turin, and found himself for the third time chargé d'affaires at that court, during a short absence of the envoy. From Turin he went to Florence, and thence to Rome. He was in Paris in 1783, and returned to London the following year. The revenue he derived from his living amounting to £800 per annum, together with a considerable legacy left him by Mr Mackenzie, and estimated at £15,000, enabled him to pass the remainder of his life in affluence. He died at London, May 23, 1812.

The principal works of Dutens were his *Recherches sur l'origine des Découvertes attribuées aux Modernes* (1766, 2 vols. 8vo); *Appel au bon Sens* (London, 1777, 8vo), directed in defence of Christi-

anity against the French philosophers, and published anonymously; *Explication de quelques médailles de Peuples, de Villes, et de Rois, Grecques et Phéniciennes* (1773, 4to); *Explication de quelques médailles du cabinet de Duane* (1774, 4to); *Troisième Dissertation sur quelques médailles Grecques et Phéniciennes* (1776, 4to); *Logique, ou l'Art de raisonner* (1773, 12mo); *Des pierres précieuses et des pierres fines, avec les moyens de les connaître et de les évaluer* (1778, 12mo); *Itinéraire des routes les plus fréquentées, ou Journal d'un Voyage aux principales Villes d'Europe* (1775, 8vo), frequently republished; *Considérations Théologiques sur les moyens de réunir toutes les Églises Chrétiennes* (1798, 8vo); *Ouvrages mêlés, contenant ses plus importants ouvrages publiés up to the date* (London, 1797, 4 vols. 4to); *L'Ami des étrangers qui voyagent en Angleterre* (1789, 8vo); *Histoire de ce qui s'est passé pour le rétablissement d'une régence en Angleterre*, (1789, 8vo); *Recherches sur le tems le plus reculé de l'usage des Routes chez les anciens* (1795); *Mémoires d'un Voyageur qui se repose* (Paris, 1736, 3 vols. 8vo). The first two volumes of the last named work contain the life of the author, written in a romantic style; the third bears the title of *Dulensiana*, and is filled with remarks, anecdotes, and bon-mots. (See memoir of Dutens in the *Gentleman's Magazine* for 1812.)

DUTROCHET, RENÉ JOACHIM HENRI (1776–1847), a French physiologist and natural philosopher, was born at Château de Néon, Poitou, November 14, 1776, and died at Paris, February 4, 1847. In 1799 he entered the military marine at Rochefort, which, however, he soon deserted to join the Vendean army. In 1802 he began the study of medicine at Paris; and in 1808 he was made physician to Joseph Bonaparte, king of Spain. Appointed chief physician to the hospital at Burgos, he distinguished himself during the prevalence of typhus in that city. He returned in 1809 to France, where he devoted himself to the study of the natural sciences. The number of his scientific publications, which relate to a great variety of topics, is very great. His *Recherches sur l'accroissement et la reproduction des végétaux*, published in the *Mémoires du Muséum d'Histoire naturelle* for 1821, procured him in that year the French Academy's prize for experimental physiology. In 1837 appeared his *Mémoires pour servir à l'histoire anatomique et physiologique des végétaux et des animaux*, a collection of all his biological papers of any importance.

DUVAL, JULES (1813–1870), a French economist, was born at Rodez, in the department of Aveyron, received his early education at the college of St Geniez d'Olt, passed as advocate at the age of twenty-three, and for eight years held an official position first at St Affrique and afterwards in his native town. On the pacification of Algeria he took an active part in the foundation of the Union Agricole d'Afrique; and in 1847 he established an agricultural colony in the plain of Siz. Obligated by ill health to abandon in 1850 the personal charge of the enterprise, he did not leave the country, but in 1852 became editor of the *Echo d'Oran*, and from 1858 to 1861 acted as member and secretary of the general council of the province of Oran. Removing to Paris in the latter year, he there devoted himself to the literary exposition of his views; and among numerous other enterprises founded and edited till his death the *Économiste Français*, a weekly periodical devoted to the treatment of all matters connected with colonization and social reform, which bore his favourite device of *libre et harmonique essor des forces*. He was killed at Plessis-lès-Tours in a railway accident on the 20th of September 1870, while on his way to his native town.

Besides a series of contributions to the *Journal des Débats* and the *Revue des Deux Mondes*, he wrote *Tableau de l'Algérie* (1854), *Les colonies et l'Algérie au concours général et national d'agriculture de Paris en 1860*, *Gheel ou une colonie d'aliénés* (1860), *Histoire de l'émigration européenne, asiatique, et africaine au XIX. siècle* (1862,—probably his masterpiece, and the work by which he gained the prize offered by the Académie des sciences morales in 1860), *Les colonies et la politique coloniale de la France* (1864), *Des rapports entre la géographie et l'économie politique* (1864), *Mémoire sur Ant. de Mont Chrétien, auteur du premier traité d'économie politique* (1868), *Notre Pays* (1869), *Notre planète* (1869). See *Levasseur's "Notice sur J. Duval"* in *Bulletin de la Soc. de Géogr.*, 1876.

DUVERGIER DE HAURANNE, JEAN (1581–1643), abbé of St Cyran, a celebrated French theologian, was born at Bayonne in 1581. He studied theology at the university of Louvain, where he formed an intimate friendship with Jansen, who was his fellow student. After quitting Louvain he went to Paris, where his intimacy with Jansen continued, and with him he pursued with great ardour the study of the fathers. Leaving Paris in 1611, they continued the same studies at Bayonne, where Duvergier received the canonry of the cathedral. When Jansen left Bayonne, Duvergier returned again to Paris, and shortly after his arrival there his inflexible and ascetic character secured for him the esteem of the bishop of Poitiers, who gave him a canonry, and in 1625 made him abbé of St Cyran. He established in the monastery the order of St Benoît in all its rigour; but his zeal for reform was so great that it awakened opposition, and he found it expedient to quit his diocese and return to Paris. Here he formed a connection with the influential Arnauld family, and along with Angelique Arnauld, directress of the convent of Port Royal, he completely reformed that institution. His rigorous asceticism acquiring for him great ascendancy over feminine minds, his fame and influence increased with great rapidity, and he soon began to number among his disciples members of the highest classes of society, and to have as his personal friends some of the chief dignitaries of church and state. Soon, however, his enemies came to be as numerous as his friends. His rigid and domineering disposition began to alienate from him many of his disciples; and, taking a leading part in the Jansenist controversy, he excited against himself the peculiar animosity of the Jesuits. At last his views came to be suspected by Richelieu, and he was arrested and thrown into prison at Vincennes, 14th March 1638. No evidence could be obtained from his papers sufficient to criminate him, but to limit his influence he was retained in durance at Vincennes—where, however, he was able to keep up intercourse with his penitents and disciples. On the death of Richelieu he regained his liberty, and resumed his religious duties and his war with the Jesuits with the same energy as before; but he enjoyed only six months of freedom, dying from a stroke of apoplexy, 10th October 1643.

DWĀRAKĀ, DWĀRKA, or JIGAT, a town of British India, in Guzerat, near the extremity of the peninsula of Kattywar, in 22° 15' N. lat. and 69° 1' E. long. It is surrounded by a wall, has about 2000 permanent inhabitants, and trades in chalk. As the birthplace and residence of Krishna, it is the most sacred spot in this part of India, and its principal temple is visited annually by many thousand pilgrims. The approach from the sea is by a fine flight of stone steps, and the great pyramid rises to a height of 140 feet. Dwārakā is of course frequently mentioned in the *Mahābhārata*. It was occupied by the British in 1816.

DWARF (Saxon *dwerg*, *dwerg*; German, *Zwerg*), a term applied to men, animals, and plants that fail to reach even the mediocrity of growth natural to their respective classes. It is also otherwise applied. In France, for instance, a yolkless egg is termed "un œuf nain," or dwarf egg; and an imitation of fine English cloth is called "nain Londrin," technically "London dwarf."

The *nanus* or *pumilo* of the Romans might be a dwarf by nature or a person dwarfed by cruel art. In the former case, his lack of height found compensation in increased strength, as exemplified in the line by Propertius, "Nanus et ipse suos breviter concretus in artus," &c.; in the latter, where growth had been early suppressed by the dealers who manufactured monstrosities for fashionable people in Rome, weakness bred contempt. The *nanus*, or, if he were more than usually diminutive, the *nanium*, was exposed to

application of the proverb, "nanus cum sis, cede," equivalent to "little people must not be in our way!"

Various have been the recipes for dwarfing children from birth. The most effective, according to report, was anointing the back bone with the grease of moles, bats, and dormice. It is also said that pups were dwarfed by frequently washing their feet and backbone; the consequent drying and hardening of those parts hindered, it was alleged, their extension. In England, the growth of boys intended for riders in horse-races is kept down to some extent by the weakening process of "sweating."

There is a familiar story of a partnership entered into between a dwarf and a giant. The dwarf had the intellect, the giant had the strength; the result of this limited liability was that the giant received all the blows, and the dwarf all the profits. The partnership was consequently broken up. A fact, of which we are reminded by this fiction, occurred in Austria in the 17th century. To please the caprice of an empress, all the giants and dwarfs in the empire were brought together to Vienna, and were lodged in one building. The dwarfs were told they had nothing to fear from the giants; but the latter were soon put in bodily fear of the dwarfs, who made the life of their stupendous companions unbearable by teasing them, molesting them, tripping them up, and unscrupulously robbing them. The giants, with tears as big as pearls in their eyes, prayed the authorities to relieve them from the persecution of their tiny enemies, and the prayer was granted. At a later period, another German princess promoted marriages among dwarfs, but without succeeding in the object she had in view. When Lady Mary Wortley Montague was in Germany, in the last century, she found that a dwarf was a necessary appendage to every noble family. At that time English ladies kept monkeys. The imperial dwarfs at the Viennese court were described by Lady Mary as "as ugly as devils" and "bedaubed with diamonds." They had succeeded the court fools, and exercised some part of the more ancient office. Absolute princes could not stoop to familiar discourse with mankind of less degree. Therefore did they hold dwarfs to be outside humanity, made intimate associates of them, and allowed them an unrestrained freedom of speech, by the exercise of which the dwarfs imparted to their masters wholesome truths which on the lips of ordinary men would have been treason. One of the kings of Denmark is said to have made a prime-minister of his dwarf, in order to get at rough truths which a minister of ordinary stature would have been afraid to utter.

It could not have been for this reason that Stanislas, ex-king of Poland and duke of Lorraine, was so attached to his dwarf, Nicholas Ferry, otherwise known as "Bébé," for this dwarf was weak in mind and body. Bébé was one of three dwarf children of peasant parents in the Vosges. He was 3 feet in height, and his fame has not died out at Nancy and the department of the Meurthe. At his death in 1764 he was in his twenty-third year; and, among the fine phrases of which his epitaph is composed, the world is still assured that Bébé was "chéri du nouvel Antonin."

But Bébé was not so remarkable a dwarf as Richebourg, who died in Paris in 1858, at the age of ninety. He was only 23 inches in height. In his childhood he was a servant (without especial duty) in the Orleans family. In later years, Richebourg was their pensioner. He is said to have been put to strange use in the Revolutionary period,—passing in and out of Paris as an infant in a nurse's arms, but with despatches, dangerous to carry, in the little man's baby wrappings! At present, on the Continent, Russia and Turkey alone have a common sympathy for dwarfs. At the court of the sultan, should the dwarf, besides being of elfish height, be deaf, dumb, and qualified to hold a place

among the official eunuchs, the poor creature is accounted as a priceless treasure.

The early history of British dwarfs is less studded with wonders than the record of dwarfs of the classical times. Britain has nothing to compare with Philetas of Cos, the little tutor of Ptolemy Philadelphus. Ælian would have us believe that Philetas was so light as well as diminutive that he wore leaden weights in his pockets to prevent his being blown away. Nor does any British chronicle register such minute marvels as the couple of dwarfs possessed by Julia, the niece of Augustus, namely, Coropas and Julia's little handmaid Andromeda. The height of both was 2 feet 4 inches. This, however, was little less than the stature of the Aztec dwarfs who were exhibited (and were publicly married) in London some twenty years ago. It is not that British annals or tradition can be said to be entirely silent on dwarfs as wonderful as Ælian's. The earliest, known by the now generic name of "Tom Thumb," presents himself to us in the ancient ballad which begins with the record that "In Arthur's court Tom Thumb did live." Antiquaries, on probably no better foundation, are content with placing the proto-Thumb at the court of King Edgar. It is certain that such shrunken samples of humanity figured in great festivals, as we see their foreign brethren in some of the pictures of the Italian and Spanish masters. The first English dwarf of whom there is authentic history was presented to Queen Henrietta by the duchess of Buckingham, as he stepped out of a pie at a banquet. This was Jeffery Hudson of Rutlandshire. He was born in 1619, and was only 1½ feet high from his eighth year to his thirtieth, after which he grew to the stature of 3 feet 9 inches, and never went beyond it. His life was not made up of court pleasures. He fought two duels,—one with a turkey-cock, a battle recorded by Davenant, and a second with Mr Crofts, who came to the meeting with a squirt, but who in the more serious encounter which ensued was shot dead by little Hudson, who fired from horseback, the saddle putting him on a level with his lofty but unlucky antagonist. Twice was Jeffery made prisoner,—once by the Dunkirkers as he was returning from France, whither he had been on homely business for the queen; the second time was when he fell into the hands of Barbary corsairs. In each case his liberty was soon purchased. But Jeffery died in prison, nevertheless. He was accused of participation in the "Popish Plot," and in 1682 this dwarf died in the Gate House, in the sixty-third year of his age.

Contemporary with Hudson were the two dwarfs of Henrietta Maria, Gibson and his wife Anne. They were married by the queen's wish; and the two together measured only a couple of inches over 7 feet. They had nine children, five of whom, who lived, were of ordinary stature. Edmund Waller celebrated the nuptials, Evelyn designated the husband as the "compendium of a man," and Lely painted them hand in hand. Gibson was miniature painter to Charles I., and drawing-master to the daughters of James II., the Princesses Mary and Anne, when they were children. This Cumberland pigmy, who began his career as a page, first in a "gentle," next in the royal family, died in 1690, in his seventy-fifth year, and is buried in St Paul's, Covent Garden. The last court dwarf in England was Copperrin, a lively little imp in the service of the Princess (Augusta) of Wales, the mother of George III. The last dwarf retainer in a gentleman's family was the one kept by Mr Beckford, the author of *Vathek* and builder of Fonthill. He was rather too big to be flung from one guest to another, as used to be done at after-dinner tables, when the wine had got the better of common sense.

Of exhibited dwarfs in England, the most celebrated was the Pole, Borulwaski, whom fashion patronized in the last

century and forgot in the present one. He was then a yard and 3 inches in height, and he had a sister shorter than himself by the head and shoulders. Borulwaski was a handsome man, a wit, and something of a scholar. He travelled over all Europe; and he—born in the reign of George II., 1739—died in his well-earned retirement near Durham, in the reign of Victoria, 1837. Borulwaski, buried in the above-named city, lies by the side of the Falstaffian Stephen Kemble. The companionship reminds one of that of the dwarf skeleton of Jonathan Wild by the side of that of the Irish Giant, at the Royal College of Surgeons, London.

In the year in which Borulwaski died, 1837, the line of publicly exhibited dwarfs was continued by the birth of the existing American pigmy, Charles Stratton, better known as "General Tom Thumb." In 1844 he appeared in England, where his grace, vivacity, and good humour made him popular, from the royal family to the general public, before whom he acted at the Lyceum Theatre. He also made his appearance on the stage in Paris. After extensive travel in both hemispheres, he again visited England in 1857, but the dwarf man, despite many personal and intellectual qualities, was less attractive than the dwarf boy. In the year 1863 the "General" married the very minute American lady, Lavinia Warren (born in 1842), with whom he has seen many lands, and they are now enjoying honourable retirement in their own. (J. DO.)

DWIGHT, TIMOTHY (1752-1817), an eminent American divine, was born at Northampton, Massachusetts, 14th May 1752. His father, though educated at Yale College, was a merchant, and his mother the third daughter of Jonathan Edwards. His mother began to instruct him almost as soon as he was able to speak, and it is said that he learned the alphabet at a single lesson, and before he was four years old was able to read the Bible. In 1765 he entered Yale College, and received his B.A. degree in 1769, shortly after which he went to take charge of a grammar school at Newhaven, where he remained two years. In September 1771 he was appointed tutor in Yale College, where he distinguished himself by the skill with which he taught the higher mathematics. In the same year he began an epic poem entitled the *Conquest of Canaan*, which was published in 1785. He received his degree of M.A. in 1772, and afterwards pursued his studies with the view of adopting law as his profession, but, changing his intention, was licensed as a preacher of the gospel in 1777, and accepted the office of chaplain to the forces, which post he held for some time. In 1783 he was ordained minister of Greenfield in Connecticut, when he opened an academy which speedily acquired a very high reputation, and attracted scholars from all parts of the Union. He received the degree of D.D. from Princeton College in 1785, and that of LL.D. from New Jersey in 1810. In 1795 he was elected president of Yale College, and by his judicious management restored that institution to the high place from which it had fallen before his appointment. He died at Philadelphia on the 11th January 1817. Dr Dwight was the author of a considerable number of ess and sermons; and his *Theology Explained and Defended in a series of Sermons* was published in 5 vols., with a life of the author, in 1818. Two additional volumes of sermons were published in 1827, and had an extensive circulation both in the United States and in England.

DWINA, a name common to two important rivers of European Russia.

(1.) The NORTHERN DWINA, or *Dvina Sievernaya*, belongs to the basin of the White Sea, and is formed by the junction of the Sukhona and the Yuk, which, rising the former in the south-east and the latter in the south-west of the government of Vologda, meet in the neighbourhood

of Veliki Ustyug, at a height of 300 feet above the sea, in 60° 46' N. lat. and 46° 20' E. long. From its mouth, in the Gulf of Archangel, the distance to the confluence of the co-tributary streams is about 400 miles, and to the source of the Sukhona 750 miles. The drainage area is estimated at from 140,000 to 145,000 square miles. Except at the rapids the current of the Dwina is comparatively slow, as the average fall per mile is only 9 inches. Till its union with the Viuchegda, a river which exceeds it in volume, it flows for the most part in a single, well-defined, and permanent channel; but below that point it often breaks up into several branches, and not unfrequently alters its course. In the neighbourhood of Archangel it divides into three distinct arms, which form a regular delta; but of these that of Berezofoff alone is navigable for seafaring vessels, and even it is crossed by a bar at the mouth with not more than 14½ or 15½ feet of water at full tide. Above the confluence of the Viuchegda the breadth is about 1750 feet; below that point it widens out to 3500; and near Archangel it attains more than three times that measure. The river affords a valuable means of inland navigation. From Vologda to Archangel the ordinary passage requires from 10 to 12 days, and the return journey from 6 to 8 weeks. The channel is free from ice for about 174 days in the year.

(2.) The SOUTHERN DWINA, or *Dvina Zapadnaya*, in German *Düna*, belongs to the Baltic basin, and takes its rise in a small lake about 800 feet above the level of the sea, in the government of Tver, not far from the sources of the Volga and the Dnieper. In its whole course of about 600 miles it waters the seven governments of Tver, Pskoff, Vitebsk, Mogileff, Vilna, Curland, and Livonia; and it is calculated that it drains an area of about 65,000 square miles. From Düna to Riga, a distance of 204 miles, there is altogether a fall of 295 feet, of which 105 are in the 46½ miles from Jakobstadt to Friedrichstadt. In the lower part of its course the river attains an ordinary depth of 30 feet, and an average breadth of 1400 feet; but during the spring flood it sometimes rises 14 feet above its usual level, and extends its waters for about a mile. The inundation lasts at Riga from two to ten days. Near the mouth the river is usually free from ice 245 days in the year, and in the government of Vitebsk for 229. It is navigable from the confluence of the Mezha downwards, but the number of rapids and shallows greatly diminishes its value. No fewer than 62 of the former are counted below Jakobstadt, and among these are some of the most dangerous of all. The passage to Riga from Velish usually takes thirteen days, from Disna seven, from Düna four, from Friedrichstadt one. Navigation can also be carried on by the following tributaries of the Dwina—the Toropa, the Usviat, the Mezha and Olshei, the Kasplia, the Ulla, and the Bolder-aa. By Ptolemy and Marcian of Heraclea the river is mentioned as the Rhodon or Rhodon; at a later date it is called the Khezín or Turunt, and till the present day has the name of Polot among the White Russians. The modern designation is said to be due to the Schleswig and Bremen sailors, who were struck by the sandstone hills at the mouth of the river.

DYCE, ALEXANDER, (1798-1869), a distinguished dramatic editor and literary historian, was born at Edinburgh on the 30th June 1798, and, after receiving his early education at the High School of his native city, became a student at Exeter College, Oxford, where he graduated as B.A. Having adopted the clerical profession, he officiated as curate at Lantegloss, in Cornwall, and subsequently at Nayland, in Suffolk; and, in 1827, he settled in London. His first books were *Select Translations from Quintus Smyrnew*, an edition of Collins, and *Specimens of British Poetesses*. He issued annotated editions of George

Peele, Robert Greene, John Webster, Thomas Middleton, and Beaumont and Fletcher, with lives of the authors and much illustrative matter. He completed an edition of Shirley left unfinished by Gifford, and contributed biographies of Shakespeare, Pope, Akenside, and Beattie to Pickering's *Aldine Poets*. He has also edited several of Bentley's works, and *Specimens of British Sonnets*; and his carefully revised edition of John Skelton, which appeared in 1843, did much to revive interest in that trenchant satirist. In 1857 his edition of Shakespeare was published by Moxon; and the second edition, a great improvement on the old one, was issued by Chapman and Hall in 1866. Dyce's interest in Shakespeare manifested itself further in such works as *Remarks on Collier's and Knight's Editions of Shakespeare*, *A Few Notes on Shakespeare*, and *Strictures on Collier's new Edition of Shakespeare*. He was intimately connected with several literary societies, and undertook the publication of Kempe's *Nine Days' Wonder* for the Camden Society; and the old plays of *Timon* and *Sir Thomas More* were published by him for the Shakespeare Society. He was associated with Halliwell, Collier, and Wright as one of the founders of the Percy Society, which aims at publishing old English poetry. Dyce also issued *Recollections of the Table-Talk of Samuel Rogers*, which has been several times reprinted both in Britain and in the United States. The editions of the dramatists already mentioned were re-issued with many improvements. Dyce died on the 15th May 1869. His reputation rests on his contributions to English literary biography, and on the untiring industry, abundant learning, and admirable critical acumen displayed in his editions of the old English poets. His wide reading in Elizabethan literature enabled him to explain much that was formerly obscure in Shakespeare; while his sound judgment was a sure check to anything like extravagance in emendation. His labours resulted in the best text of Shakespeare we possess. While preserving all that is valuable in former editions, Dyce has added much fresh matter. The *Glossary*, which consists of a large volume of 500 pages, is the most exhaustive that has appeared. Not only rare words are explained, but common words when employed with an unusual meaning, phrases, proverbs, old customs, and difficult allusions. The book is, therefore, an important contribution to philology and to the history of the English language, as well as to the elucidation of the text. The mere number of words in Dyce's *Glossary* shows a great advance in comprehensiveness. It is calculated that the *Globe Glossary* has about 2000 words, and Staunton's 2500, while Dyce's has upwards of 5000. The meanings of the words, as used by the poet, are accurately given, and are illustrated by literary quotation and linguistic comment. Altogether Dyce's Shakespeare is likely long to remain the standard edition of our English dramatist.

DYCE, WILLIAM (1806-1864), a distinguished painter, was born in Aberdeen, where his father, a fellow of the Royal Society, was a physician of some repute. He attended Marischal College, took the degree of M.A. at sixteen years of age, and was destined for one of the learned professions. Showing a turn for design instead, he studied in the school of the Royal Scottish Academy in Edinburgh, then as a probationer (not a full student) in the Royal Academy of London, and thence, in 1825, proceeded to Rome, where he spent nine months. He returned to Aberdeen in 1826, and painted several pictures; one of these, Bacchus nursed by the Nymphs of Nysa, was exhibited in 1827. In the autumn of that year he went back to Italy, showing from the first a strong sympathy with the earlier masters of the Florentine and allied schools. A *Virgin and Child* which he painted in Rome in 1828 was much noticed by Overbeck and other foreign artists. In 1829 Dyce settled in

Edinburgh, taking at once a good rank in his profession, and showing considerable versatility in subject-matter. Portrait-painting for some years occupied much of his time; and he was particularly prized for likenesses of ladies and children. In February 1837 he was appointed master of the school of design of the Board of Manufactures, Edinburgh. In the same year he published a pamphlet on the management of schools of this description, which led to his transfer from Edinburgh, after eighteen months' service there, to London, as superintendent and secretary of the then recently established school of design at Somerset House. Mr J. R. Herbert was head-master about the same time. Dyce was sent by the Board of Trade to the Continent to examine the organization of foreign schools; and a report which he eventually printed, 1840, led to a remodelling of the London establishment. In 1842 he was made a member of the council and inspector of provincial schools, a post which he resigned in 1844. In this latter year, being appointed professor of fine art in King's College, London, he delivered a noticeable lecture, *The Theory of the Fine Arts*. In 1835 he had been elected an associate of the Royal Scottish Academy; this honour he relinquished upon settling in London, and he was then made an honorary R.S.A. In 1844 he became an associate, in 1848 a full member, of the London Royal Academy; he also was elected a member of the Academy of Arts in Philadelphia. He was active in the deliberations of the Royal Academy, and it is said that his tongue was the dread of the urbane President, Sir Charles Eastlake, for Dyce was keen in speech as in visage; it was on his proposal that the class of retired Academicians was established. In January 1850 Dyce married Jane, daughter of Mr James Brand, of Bedford Hill, Surrey. He died of a cancerous disease in his house at Streatham on 14th February 1864, leaving two sons and two daughters.

Such is a brief outline of the honourable and prosperous career of one of the most learned and accomplished of British painters—one of the highest in aim, and most consistently self-respecting in workmanship. His finest productions, the frescoes in the Queen's Robing-room in the Houses of Parliament, may rightly be called great, and an honour to the country and time which produced them; these frescoes, and the water-glass paintings of Maclise in the same building, would find few rivals in contemporary Continental labours. Generally, however, there is in Dyce's work more of earnestness, right conception, and grave, sensitive, but rather restricted powers of realization, than of authentic greatness. He has elevation, draughtsmanship, expression, and on occasion fine colour; along with all these, a certain leaning on precedent, and castigated semi-conventionalized type of form and treatment, which bespeak rather the scholarly than the originating mind in art. The following are among his principal or most interesting works (oil pictures, unless otherwise stated). 1829: The Daughters of Jethro defended by Moses; Puck. 1830: The Golden Age; the Infant Hercules strangling the Serpents (now in the National Gallery, Edinburgh); Christ crowned with Thorns. 1835: A Dead Christ (large lunette altar-piece). 1836: The Descent of Venus, from Ben Jonson's "Triumph of Love;" The Judgment of Solomon, prize cartoon in tempera for tapestry (National Gallery, Edinburgh). 1837: Francesca da Rimini (National Gallery, Edinburgh). 1838, and again 1846: The Madonna and Child. 1839: Dunstan separating Edwy and Elgiva. 1844: Joash shooting the Arrow of Deliverance (the finest perhaps of the oil-paintings). 1850: The Meeting of Jacob and Rachel. 1851: King Lear and the Fool in the Storm. 1855: Christabel. 1857: Titian's first Essay in Colouring. 1859: The Good Shepherd. 1860: St John bringing Home his Adopted Mother;

Pegwell Bay (a coast scene of remarkably minute detail, showing the painter's partial adhesion to the so-called "pre-Raphaelite" movement of that time). 1861: George Herbert at Bemerton. Dyce executed some excellent cartoons for stained glass:—that for the choristers' window, Ely Cathedral, and that for a vast window at Alnwick in memory of a duke of Northumberland; the design of Paul rejected by the Jews, now at South Kensington, belongs to the latter. In fresco-painting his first work appears to have been the Consecration of Archbishop Parker, painted in Lambeth Palace. In one of the Westminster Hall competitions for the decoration of the Houses of Parliament, he displayed two heads from this composition; and it is related that the great German fresco-painter Cornelius, who had come over to England to give advice, with a prospect of himself taking the chief direction of the pictorial scheme, told the Prince Consort frankly that the English ought not to be asking for him, when they had such a painter of their own as Mr Dyce. The cartoon by Dyce of the Baptism of Ethelbert was approved and commissioned for the House of Lords, and is the first of his works done there, 1846, in fresco. In 1848 he began his great frescoes in the Robing-room—subjects from the legend of King Arthur, exhibiting chivalric virtue. The whole room was to have been finished in eight years; but ill-health and other vexations trammelled the artist, and the series remains uncompleted. The largest picture figures Hospitality, the admission of Sir Tristram into the fellowship of the Round Table. Then follow—Religion, the Vision of Sir Galahad and his Companions; Generosity, Arthur unhorsed, and spared by the Victor; Courtesy, Sir Tristram harping to la Belle Yseult; Mercy, Sir Gawaine's Vow. The frescoes of sacred subjects in All Saints' Church, Margaret Street, London; of Comus, in the summer-house of Buckingham Palace; and of Neptune and Britannia, at Osborne House, are also by this painter.

Dyce was an elegant scholar in more ways than one. In 1828 he obtained the Blackwell prize at Aberdeen for an essay on animal magnetism. In 1843-4 he published an edition of the Book of Common Prayer, with a dissertation on Gregorian music, and its adaptation to English words. He founded the Motett Society, for revival of ancient church-music, was a fine organist, and composed a "non nobis" which has appropriately been sung at Royal Academy banquets. His last considerable writing relating to his own art was published in 1853, *The National Gallery: its Formation and Management*.

DYEING is the art of colouring in a permanent manner porous or absorbent substances by impregnating them with colouring bodies. Most vegetable and animal bodies are porous or absorbent, and can be dyed; some minerals also, such as marble, can absorb liquid colouring matters; but the term dyeing is usually confined to the colouring of textile fibrous materials by penetration. The superficial application of pigments to tissues by means of adhesive vehicles, such as oil or albumen, as in painting or in some kinds of calico-printing, is not considered as a case of dyeing, because the colouring bodies so applied do not penetrate the fibre, and are not intimately incorporated with it. The mere saturation of textile fibre with a solution of some coloured body and subsequent drying do not constitute a case of dyeing, unless the colour becomes in so far permanently attached to the fibre that it cannot be washed out again by the solvent employed or by common water. In the present article dyeing will be considered only with relation to the vegetable and animal fibrous substances which are commonly used in clothing or furniture,—the less important arts of dyeing feathers, skins, ivory, wood, marble, &c., being left over for treatment under other headings.

HISTORICAL SKETCH.

That dyeing was practised in the most ancient times is abundantly proved by the frequent mention of dyed colours in the oldest extant writings; that it was not a common art seems apparent from the uses to which coloured garments were devoted, and the distinction which they conferred upon the wearers. It is probable that such definite and bright colours as the "blue, and purple, and scarlet" mentioned several times in the book of Exodus, as well as the Tyrian purple so often referred to by Roman writers of the Augustan age, were so costly as not to be available for general and common use. Pliny is the only one of the older writers from whom we might have expected some account of the processes of dyeing employed at his time; but, except a reference to two or three tinctorial substances, and a description of a process of obtaining several colours by one dyeing operation, which he saw practised in Egypt (see CALICO-PRINTING, vol. iv. p. 684), there is nothing detailed in his writings;—he in fact formally excuses himself from entering upon the subject as one not worthy of his attention. The Tyrian purple is the only dye treated of at some length in Pliny and contemporary authors; its discovery and employment gave wealth and prosperity to Tyre and Sidon more than 1000 years B.C. In the days of the Roman conquests in the East it was reserved under penal statutes for imperial use; its production then declined, and eventually both the material and the art of using it were lost. From Pliny's description, modern investigators were enabled to rediscover the shell-fish which yielded the dye; but the colours furnished by it were neither so bright nor so permanent as those obtainable from much less costly dyeing materials; and there is reason to conclude that the most brilliantly tinted garments of an Egyptian priest of Isis or Osiris, or the mantle of a Roman emperor, were poor and dull in hue compared with those within reach of a domestic servant of the present time.

From many independent sources—Homer, Strabo, Herodotus, &c.—it is clearly shown that the manufacture of coloured tissues was carried on by the Oriental nations. A knowledge of the art spread slowly westward, but there are few records of its existence to be found from the time of Pliny to about the 13th century. It would appear that the Jews held the secret or the monopoly of the dyeing art during this long period. According to Mrs Merrifield, Benjamin of Tudela relates that when he visited Jerusalem between 1160 and 1173 he found only 200 Jews resident in that city, and these were all engaged in wool-dyeing, which trade was entirely in their hands. Beckmann shows that at the same epoch the art of dyeing in Italy was principally carried on by Israelites. It is in Sicily that we can first distinctly discern the practice of dyeing in Europe; afterwards the Italians generally practised it; and in the 13th century dyers formed important guilds in Florence, Venice, and other cities. It is not to be supposed that the art of dyeing was ever completely lost; the records of particular seats of the art only indicate that at such places some special excellence had been acquired which gave them a higher reputation than was enjoyed by others. The domestic records of all modern nations speak of dyers and dyed cloths. Among the ancient laws of Ireland are some which lay down the number of colours that may be employed in the dress of various classes of society, the monarch alone being permitted to wear seven colours; from which it may be inferred that if the Irish at a very early period were not dyers, they at least had variously dyed garments. Similar facts can be adduced of all countries that possess an early literature.

From the perishable nature of textile substances and their comparatively small intrinsic value, very few ancient

examples of the dyer's art have been preserved. We have, however, one account of a cloth containing dyed yarn which may have been in the dyer's hands in Egypt 1000 years before the Christian era; and we have still in good preservation ecclesiastical vestments containing dyed silks which are certainly 600 to 700 years old. The late Mr Thomson of Clitheroe examined numerous mummy cloths, some of which had a border of blue and fawn-colour made by coloured threads introduced into the loom. The blue, upon examination, was proved to have been dyed with indigo; other specimens of mummy cloth of a reddish colour appeared to have been dyed with safflower, though this colouring matter could not be recognized with the same certainty as indigo. Dr Rock, in his catalogue of the textile fabrics in the South Kensington Museum, attributes many of the church vestments there preserved to the 12th and 13th centuries, and in these can be seen silks of all the colours known to dyers up to the middle of the present century, which, though in most cases changed and faded, still present sufficient evidence that dyeing, upon this material at least, was successfully practised in the Middle Ages. It is interesting further to note that in inventories of vestments of the 13th century the silks in the vestments are often designated by their colours, as in a chasuble at St Paul's, London, 1295, which is set down as "purpureo aliquantulum sanguineo," of a purple inclining to blood red. This, as Dr Rock says, is intelligible; but other definitions are not, as "pauus Tarsici coloris," a Tarsus-coloured cloth; it can only be conjectured that it was a purple dyed at Tarsus, and something like the Tyrian purple; sky-blue silk is named "indicus," probably because it was dyed with indigo.

The earliest account of the processes and materials used by dyers is to be found in a collection of manuscripts in the French National Library, No 6741, known as the manuscripts of Jehan le Begue. These mostly refer to the art of painting and the making of artists' colours and the modes of applying them, but some describe the preparation and use of dyes. The most interesting of these manuscripts is by Jehan Alcherius (Le Begue was only the copier or compiler), which from internal evidence cannot be dated later than the year 1410, and some parts of which refer to a period at least thirty years earlier. Among the colouring matters and mordants there mentioned we find iron (the dust or mud from grindstones on which knives are ground) dissolved in vinegar and mixed with alum, green copperas, and gall nuts prescribed as a black colour; and methods are given for the use of Brazil wood, litmus, indigo, in conjunction with lime and honey, verdigris, alkalies, oxide of tin, kermes, &c., much in the same way as those employed four centuries later by dyers and calico-printers. There are also eleven receipts for preparing colours, for painting on cloth to imitate tapestry,—examples of which (*toiles peintes*) of the 15th century were exhibited in Paris in 1876. Curiously enough, a certain Fleming named Theodore in 1410 brought these receipts to Alcherius from London, where they were in regular use. They are all chemical dyes, and seem to be the prototypes of the same class of colours employed long subsequently by calico-printers in England and other countries.

The first printed account of dyeing processes was an Italian work. It is referred to under the title *Marieyola dell' arte dei Tintori*, published at Venice in 1429. The writer has never seen a copy of this work, nor does it appear that any exists in the chief libraries of Europe; an enlarged edition was published in 1510. In 1548 Rosetti wrote an account of dyeing, which was also published at Venice. Copies of this are not very scarce; it is the only one of these early books which is actually known. The so-called Bolognese manuscript translated in Merrifield's