

improve the appearance of the finished coin by removing all traces of impurity from the surface of the blank. It has, however, been abandoned in the British mint except in the case of some of the smaller silver coins, mainly because the soft superficial layer of metal wears away with undue rapidity. Certain precautions suggested in 1869 by Mr Hill, the superintendent of the operative department, for avoiding oxidation or tarnishing of the metal during coining rendered the abolition of the process possible.

The blanks receive the impression which constitutes them coins from engraved dies. Each is placed in the lower of two dies, and the upper die is brought forcibly down upon it. The lateral escape of the metal is prevented by a collar which surrounds the blank while it is being struck. This collar may be either plain or engraved, and if the latter is the case any device or ornament it may bear will be imparted to the edge of the blank.

The coining presses used in various mints may be divided into three types:—(1) the screw press worked by atmospheric pressure, (2) the eccentric press, and (3) the lever press. The first of these (see *Ency. Brit.*, 8th ed., vol. vii. p. 92) has now been abandoned. In the eccentric press the power is applied to a shaft bearing an eccentric which acts by means of a connecting rod upon a vertical slide holding the die which is brought down on the blank. This form of press is used in the mint at Constantinople, where the atmospheric screw press is also still retained. Of the third type, the lever press, there are two modifications, devised respectively by Thonnelier and by Uhlhorn. The details of the Uhlhorn press have been improved by Messrs R. Heaton & Sons of Birmingham; and, their superiority to the old vacuum screw press having been demonstrated by careful experiments, they have been finally adopted in the newly arranged mint, which contains fourteen of them. This press is shown in figs. 10 and 11. It is driven from below the floor of the press-room by bands which pass over fast and loose pulleys on the same shaft that bears the fly-wheel. The loose pulley, however, is only used when it is necessary to stop the machine entirely, as the fly-wheel is permitted to revolve without imparting motion to the shaft so long as a lever M, worked from the front of the machine, does not cause the fly-wheel to be connected with the driving wheel by means of two pins. The dies are placed in the front part of the machine (fig. 10). The lower one is firmly fixed to the bed, while the upper is held at A by the upper of two jaws F and A', or levers, the fulcrum of which are so close together as almost to coincide, the lower jaw A' bearing the collar which encircles the blank while it is being converted into a coin; the upper jaw F, A, governed by the weighted lever H shown below the bed of the machine, has a tendency to rise a sufficient distance to admit the blank between the upper and lower die. A crank B on the shaft bearing the fly-wheel is connected by a rod C with the bent lever D, and this bent lever, acting through the toggle joint and a piece of metal E connected with the jaw that bears the

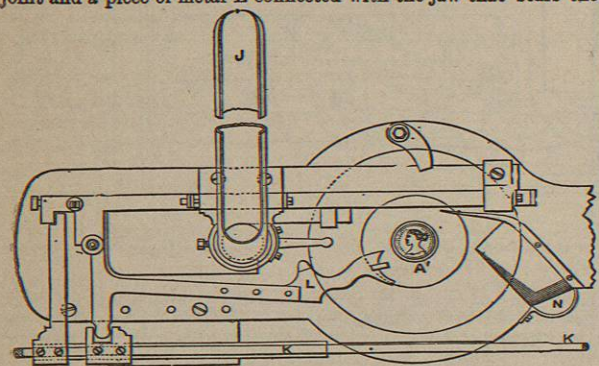


Fig. 12.

upper die, forces it down, and thus squeezes the blank between the upper and lower dies. A cam on the crank shaft acting on the lower of the two levers G shown below the bed of the machine causes the lower jaw A' bearing the collar which surrounded the blank to be depressed sufficiently to leave the finished coin freely resting on the lower die, from whence it is driven down the shoot N by the next blank in succession. Coins are produced at rates varying from 60 to 120 a minute, 90 a minute giving the best results. The blanks to be converted into coins are placed on the slide J, and the advance of each blank in succession is regulated by the rod called the "layer on" K, the backward and forward movement of which is also regulated by an eccentric on the crank shaft. The details of this part of the machine are shown in plan, fig. 12.

The last operation before the finished coin is returned to the mint office for issue to the public is the weighing each gold or silver piece separately. This is effected in the American and in most Continental

mints by hand, but in England automatic balances of beautiful construction are employed. They were originally devised for separating worn pieces from those of current weight, but they are now employed to distinguish between "light," "heavy," and "good" pieces, the latter alone being permitted to pass into circulation. In the newly arranged department thirty such machines are provided. Each is driven from overhead shafting by means of gut lines. The driving pulleys derive their motion from a small atmospheric engine, which is found to give more satisfactory results than would be the case if the steam-engine were employed directly.

Each balance is worked by a cone pulley A (fig. 13) by a gut line passing round it from the loose pulleys B, the necessary tension being imparted to the line by means of a spring C. The tension of the line is, however, but slight, for if the action of the balance is arrested by accident the cord slides over the cone pulley A without turning it. It will be obvious that the use of the cone pulley enables the machine to be driven with varying degrees of speed. The toothed wheel D is mounted on the spindle which bears the driving pulley A, but it acts only through the intervention of a friction cheek, which is so lightly screwed against the driving wheel that it would cease to act if the machine should be accidentally deranged. The wheel D sets in motion the wheels E, E', E". The cam F, acting on the curved extremity of the rocking frame G, causes the slide H to bring forward one of a series of coins (arranged in the hopper I) until it rests on the plate J of the balance beam, of which beam a portion is shown in an enlarged drawing above the balance, while the plate that receives the coin is also shown in a separate drawing to the left of the machine. Another cam K then comes into play, and enables the forceps, shown at L, to release the rod M to which the balance plate J is attached. The forceps L serves to keep the rod steady while the coin is being placed on the plate J. A rod shown at N is then raised by the cam O, the lower extremity of the rod being kept steady by a pin sliding in a hole in the bottom plate of the balance, and its upper end by a pin which works into the central support of the balance beam. At the base of this rod N, and at right angles to it, there is a metallic bar QQ, the ends of which pass through stirrups in the pendants M and P from the opposite ends of the beam. The elevation of this horizontal rod by the cam O simultaneously releases both ends of the beam, and the coin placed on the beam plate has then, for the first time, a direct influence on the beam. If the coin is "too light" the counterpoise R in the cage at the end of the rod P will raise the coin, and the revolution of the machine then causes part of the cam K to permit a spring to close the forceps L and to hold the pendant M firm. An indicating finger T then falls, and by means of a horizontal lever UU, which fits into one of three inverted steps on the bottom of the shoot V, determines over which of three orifices W, W', W" in the bottom plate of the balance this shoot shall stand. In the meantime the advance of the slide H brings the next piece forward, and displaces the coin which has hitherto occupied the beam plate J, forcing the coin down the shoot V, and thence through the orifice W into a receptacle, external to the balance, destined for the reception of "light coin." If this next piece should be "too heavy" it will not only raise the counterpoise R but will also elevate a little wire S, which would otherwise remain undisturbed on a support. This little wire represents the "working remedy" for the particular denomination of coin in question, which, for safety, is less by 1/12th of a grain than the remedy permitted by law. The undue weight of the "heavy coin" will depress the right end of the balance beam and its pendant M to the lowest possible point, and the indicating finger T will, in this case, determine that the rod UU shall occupy the lowest step of the shoot V, which will consequently stand over the orifice W" in the bottom plate of the balance which communicates with the receptacle for the "heavy" coins, and the heavy coin on the beam plate will be driven down the shoot by the next coin in succession. If the coin which is next brought forward by the slide H should be a "good" one, that is, if it is within the working "remedy," its action will be as follows. It may be slightly heavier than the counterpoise, but not sufficiently heavy to lift both the counterpoise and the remedy wire. The balance beam consequently remains approximately horizontal, and the indicating finger T will cause the rod UU to strike the centre step of the shoot V, which will then stand over the central orifice W' in the bed plate which communicates with a receptacle for "good" coins, into which the coin will find its way, as soon as it is driven from the beam plate by the next coin of the series. It will be evident that this excellent appliance both weighs and classifies the coins. About twenty-three coins are passed through it in a minute.

In order to show the importance of extreme accuracy in weighing, it may be pointed out that, although by the Coinage Act of 1870 the "remedy" or allowed variation above or below the standard weight of a sovereign is only 1/12th of a grain, yet in a million sterling of sovereigns the difference between the least and the greatest weight the law allows would be no less than £324.

The manufacture of coin is not the only work which is performed in the Royal Mint. All medals issued to the

army and navy, as well as those given by the Royal Society and the university of London and some others, are struck in the mint, and their preparation forms a considerable part of the work of the die department. Since 1874 the clasps and bars for the medals have also been manufactured in the mint, whence they have been issued completely mounted. Another operation, not connected with the coining, which is performed in the mint

is the assay of the "diet" or metal scraped from the gold and silver plate manufactured at Sheffield and Birmingham under the direction of the warden of the standard of wrought plate for those towns. By Act of Parliament it is directed that this shall be brought once in each year to the mint to be assayed by the "king's assay master," under the supervision of an officer appointed by the lords of the Treasury.

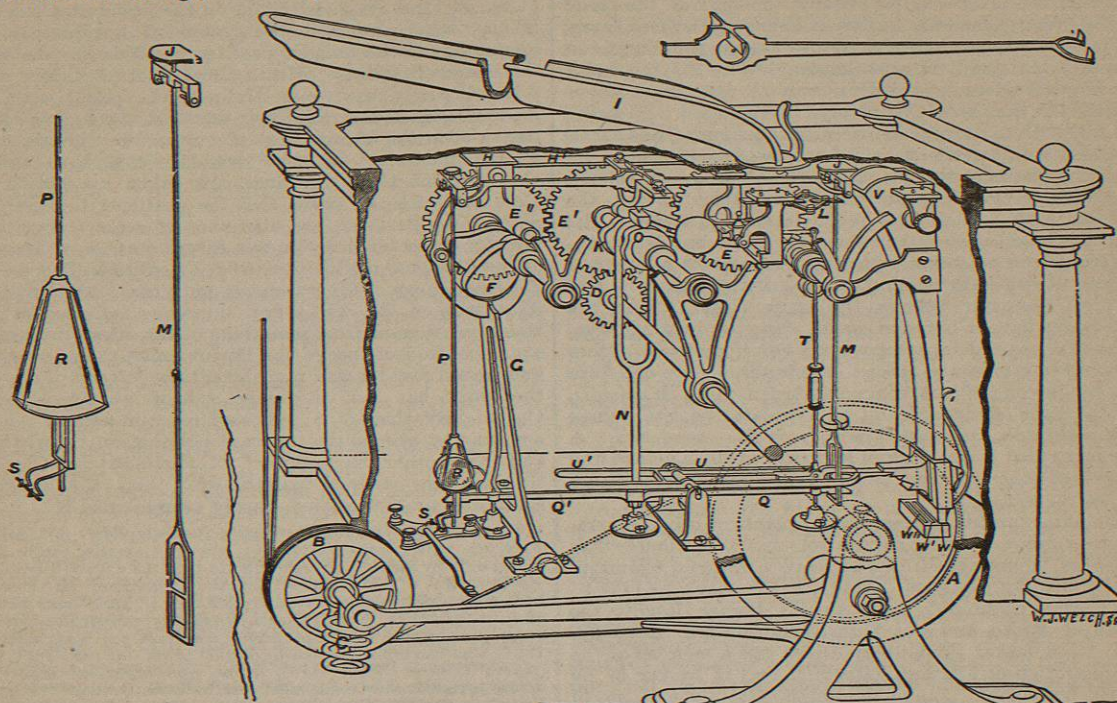


Fig. 13.—Automatic Balance.

The gold coin in circulation in Great Britain is estimated at £100,000,000. It may be well to add the following table, which gives the value of the gold and silver coinages of four of the most important foreign countries, in two recent years:—

	1880.		1881.	
	Gold.	Silver.	Gold.	Silver.
United States	£12,461,655	£5,481,941	£19,370,178	£5,587,840
Germany	1,352,430	...	326,837	...
Austria	493,605	1,674,712	485,999	1,805,734
France	83,646	259,910
	£14,287,690	£7,156,653	£20,266,660	£7,653,484

The value of the gold coinage of the American mints during the fiscal year ending June 1882 amounted to \$89,413,447.50.—being greater than that of any previous year in their history. (W. C. E.—R. A. H.)

MINT, botanically *Mentha*, a genus of labiate plants, comprising about twenty species of perennial herbs, widely distributed throughout the temperate and sub-tropical portions of the globe. All the species are furnished with square stems, opposite, aromatic leaves, and creeping roots. The flowers are arranged in axillary cymes, which either form separate whorls or are crowded together into a terminal spike. The corolla is usually small, and of a pale purple or

pinkish colour; it has four nearly equal lobes, and encloses two long and two short stamens. Great difficulty is experienced by botanists in discriminating the species of this genus by reason of the occurrence of a large number of intermediate forms, nearly three hundred of which have been named and described. Many of these varieties are permanent in consequence of being propagated by stolons.

In Britain nine of the recognized species are indigenous. *Mentha viridis*, L., or Spearmint, grows in marshy meadows, and is the species commonly used for culinary purposes; it is distinguished by its smooth, sessile leaves and lax tapering flower-spikes. *Mentha sylvestris*, L., or Horsemint, chiefly differs from the above in its coarser habit and hairy leaves, which are silky beneath, and in its denser flower-spikes. This plant is supposed to be the mint of Scripture, as it is extensively cultivated in the East, and is much used in cookery; it was one of the bitter herbs with which the paschal lamb was eaten. *M. rotundifolia* resembles the last in size and habit, but is readily distinguished by its rounded wrinkled leaves, which are shaggy beneath, and by its lanceolate bracts. The last two species usually grow on damp waste ground near roadsides. *M. aquatica*, or Capitate Mint, grows in ditches and by the side of streams, and is easily recognized by its rounded flower-spikes and stalked hairy leaves. *M. Piperita*, or Peppermint, has stalked smooth leaves and an oblong obtuse terminal spike of flowers; it is extensively culti-

vated for its volatile oil. *M. pratensis* belongs to a group of mints which, unlike the foregoing, have the flowers arranged in axillary whorls and never in terminal spikes; it otherwise bears some resemblance in foliage and habit to *M. viridis*. *M. sativa*, the Whorled Hairy Mint, grows by damp roadsides, and *M. arvensis* in cornfields; they are distinguished from *M. pratensis* by their hairy stalked leaves, which in *M. arvensis* are all equally large, but in *M. sativa* are much smaller towards the apex of the stem. *M. Pulegium*, commonly known as Pennyroyal, more rarely as Flea-mint, has small oval obtuse leaves and flowers in axillary whorls, and is remarkable for its creeping habit and peculiar odour. It differs from all the mints above described in the throat of the calyx being closed with hairs. It is met with in damp places on grassy commons, and forms a well-known domestic remedy for female disorders.

All the plants of the genus *Mentha* abound in a volatile oil, which is contained in small receptacles having the appearance of resinous dots in the leaves and stems. The odour of the oil is similar in several species, but is not distinctive, the same odour occurring in varieties of distinct species, while plants which cannot be distinguished by any botanical character possess the same odour. Thus the peppermint flavour is found in *M. Piperita*, in *M. incana*, and in Chinese and Japanese varieties of *M. arvensis*. Other forms of the last-named species growing in Ceylon and Java have the flavour of the common garden mint, *M. viridis*, and the same odour is found to a greater or less degree in *M. sylvestris*, *M. rotundifolia*, and *M. canadensis*. A bergamot scent is met with in a variety of *M. aquatica* and in forms of other species. Most of the mints may be found in blossom in August.

The name mint is also applied to plants of other genera, *Monarda punctata* being called Horsemint, *Pycnanthemum limifolium*, Mountain Mint, and *Nepeta Cataria*, Catmint.

MINTO, SIR GILBERT ELLIOT, FIRST EARL OF (1751-1814), was descended from an old border family, the Elliots of Minto, and was born at Edinburgh, April 23, 1751. His father, Sir Gilbert Elliot, was a member of the administration of Pitt and Grenville, and is spoken of by Horace Walpole as "one of the ablest men in the House of Commons." Young Elliot was educated by a private tutor, with whom at the age of twelve he went to Paris, where David Hume, who was then secretary of the embassy, undertook, from friendship to his father, the special charge of superintending his studies. After spending the winters of 1766 and 1767 at Edinburgh University, Elliot entered Oxford. On quitting the university he became a member of Lincoln's Inn, and was in 1774 called to the bar. He entered parliament in 1776, the year of his father's death. Although he gave a general support to Lord North's administration, he from the beginning occupied an independent position, and in 1782 supported the address of the Commons against an offensive war with America. From this time he became a declared follower of Fox and Burke, with the latter of whom he gradually came to be on terms of great intimacy. He was created Baron Minto in 1797, and after filling several diplomatic posts with great success became in 1807 governor-general of India. The character and events of his rule in India are described in vol. xii. p. 805. He was created Earl of Minto and Viscount Melgund in 1813. He returned to England in 1814, and died on June 21st of that year.

See *Life and Letters of Sir Gilbert Elliot, first Earl of Minto*, from 1751 to 1806, 1874; and *Life and Letters*, 1807-14, 1880. See also MIRABEAU.

MINUCIUS FELIX, MARCUS, one of the earliest, if not the earliest, of the Latin apologists for Christianity. Of his personal history nothing is known, and even the date at which he wrote can be only approximately ascertained.

Jerome (*De Vir. Ill.*, 58) speaks of him as "Romæ insignis caudicus," but in this he is probably only improving on the expression of Lactantius (*Inst. Div.*, v. 1) who speaks of him as "non ignobilis inter caudicos loci." He is now exclusively known by his *Octavius*, a dialogue on Christianity between the pagan Cæcilius Natalis¹ and the Christian Octavius Januarius, a provincial solicitor, the friend and fellow-student of the author. The scene is pleasantly and graphically laid on the beach at Ostia on a holiday afternoon, and the discussion is represented as arising out of the homage paid by Cæcilius, in passing, to the image of Serapis. His arguments for paganism, which proceed partly upon agnostic grounds, partly upon the inexpediency of disturbing long-established religious beliefs, partly upon the known want of culture in Christians, the alleged indecency of their worship, and the inherent absurdity of their doctrines, are taken up seriatim by Octavius, with the result that the assailant is convinced, postponing, however, the discussion of some things necessary for perfect instruction to a future occasion. The form of the dialogue, modelled on the *De Natura Deorum* and *De Divinatione* of Cicero, shows much care and ability, and its style is on the whole both vigorous and elegant if at times not exempt from something of the affectations of the age. If the doctrines of the Divine unity, the resurrection, and future rewards and punishments be left out of account, the work has less the character of an exposition of Christianity than of a philosophical and ethical polemic against the absurdities of crass polytheism. Christology and the other metaphysics of distinctively Christian theology are entirely passed over, and the canonical Scriptures are not quoted, hardly even alluded to.

The *Octavius* is admittedly earlier than Cyprian's *De Idolorum Vanitate*, which borrows from it; how much earlier can be determined only by settling the relation in which it stands to Tertullian's *Apologeticum*. The argument for the priority of Minucius has been most exhaustively set forth by Ebert ("Tertullian's Verhältniss zu Minucius Felix," in vol. v. of the philologico-historical series in *Abhandl. d. Königl. Sächs. Gesellsch. der Wissenschaften*, 1868), who has been followed by Teuffel (*Röm. Lit.*, sec. 368), Keir (*Celsus Wahres Wort*, 1873), Kuhn, and other scholars. The opposite view is ably maintained by Professor Salmon ("Minucius Felix" in Smith's *Dict. Christ. Biogr.*, 1882). The *Octavius* was first printed (Rome, 1543) as the eighth book of Arnobius *Adv. Gentes*; Balduinus (Heidelberg, 1560) first assigned it to its proper author. There have been numerous subsequent editions, the best being that of Halm in the *Corp. Scriptor. Eccl. Lat.* (Vienna, 1867). See Kuhn's monograph, *Der Octavius des Minucius Felix* (1882).

MINUET (Fr. *Menuet*, from [*pas*] *menus*), a very graceful kind of dance, consisting of a coupee, a high step, and a balance. Its invention is universally ascribed to the inhabitants of Poitou. The melody begins with the down beat, and contains three crotchets in a bar. The music is made up of two strains, which, from being repeated, are called *reprises*, each consisting of eight or more bars, but very rarely of an odd number. Walther speaks of a minuet in Lully's opera of *Roland*, each strain of which contains ten bars, the sectional number being five,—a circumstance which renders it very difficult to be danced; but Lully's system of phrasing was remarkably irregular. Modern instrumental composers have introduced into their symphonies and quartets, &c., minuets of rapid movement and fanciful character, followed by supplementary strains (called trios) in a different style. Some of these compositions bear but very slight resemblance to the older forms; and many of them begin with the third beat in the bar. The finest minuets we possess are those in Handel's *Samson* and Mozart's *Don Giovanni*.

MIRABEAU, HONORÉ GABRIEL RIQUETI, COMTE DE, (1749-1791), one of the greatest statesmen and orators

¹ This name occurs in six inscriptions of the years 211-217 found at Constantine (Cirta), North Africa (*C. I. L.*, vol. viii.).

France has ever produced, was born at Bignon, near Nemours, on March 9, 1749. M. de Loménie has shown that the family of Riquet or Riqueti came originally from the little town of Digne, that they won wealth and municipal honours as merchants at Marseilles, and that in 1570 Jean Riqueti bought the chateau and estate of Mirabeau, which had up to that time belonged to the great Provençal family of Barras, and took the title of esquire a few years later. In 1685 Honoré Riqueti obtained the title of Marquis de Mirabeau, and his son Jean Antoine brought honour to it. He served with distinction through all the later campaigns of the reign of Louis XIV., and especially distinguished himself in 1705 at the battle of Cassano, where he was so severely wounded in the neck that he had ever after to wear a silver stock; yet he never rose above the rank of colonel, owing to his eccentric habit of speaking unpleasant truths to his superiors. On retiring from the service he married Françoise de Castellane, a remarkable woman, who long survived him, and he left at his death, in 1737, three sons—Victor, Marquis de Mirabeau (see next article), Jean Antoine, Bailli de Mirabeau, and Comte Louis Alexandre de Mirabeau. The great Mirabeau was the elder surviving son of the marquis. When but three years old he had a virulent attack of confluent small-pox which left his face for ever disfigured, and contributed not a little to nourish his father's dislike to him. His early education was conducted by Lachabeaussière, father of the better known man of letters, after which, being like his father and grandfather destined for the army, then the only profession open to young men of family, he was entered at a pension militaire at Paris, kept by an Abbé Choquart. Of this school, which had Lagrange for its professor of mathematics, we have an amusing account in the life of Gilbert Elliot, first earl of Minto, who with his brother Hugh, afterwards British minister at Berlin, there made the acquaintance of Mirabeau, an acquaintance which soon ripened into friendship, and to which Mirabeau in later life owed his introduction into good English society. On leaving this school in 1767 he received a commission in the cavalry regiment of the Marquis de Lambert, which his grandfather had commanded years before. He at once began love making, and in spite of his ugliness succeeded in winning the heart of the lady to whom his colonel was attached, which led to such scandal that his father obtained a lettre de cachet, and the young scapegrace was imprisoned in the isle of Rhé. The love affairs of Mirabeau form quite a history by themselves, and a well-known history, owing to the celebrity of the letters to Sophie; and the behaviour of the marquis in perpetually imprisoning his son is equally well known, and as widely blamed. Yet it may be asserted that until the more durable and more reputable connexion with Madame de Nehra these love episodes were the most disgraceful blemishes in a life otherwise of a far higher moral character than has been commonly supposed. As to the marquis, his use of lettres de cachet is perfectly defensible on the theory of the existence of lettres de cachet at all. They were meant to be used (see LETTRES DE CACHET) by heads of families for the correction of their families, and Mirabeau, if any son, surely deserved such correction. Further, they did have the effect of sobering the culprit, and the more creditable part of his life did not begin till he left Vincennes. Mirabeau, it may be remarked at once, was not a statesman of the Alcibiades type, and he did not develop his great qualities of mind and character until his youthful excesses were over. These will be passed over as rapidly as possible, for it was not till 1781 that the qualities which made him great began to appear.

On being released from his first imprisonment, the young count, who had always intended to continue his military

career, obtained leave to accompany as a volunteer the French expedition which was to effect the reduction of Corsica. The conquest was one of sheer numerical strength, for the whole population was on the side of Paoli, and Mirabeau, perceiving the value of public opinion, is said to have written a treatise on the oppression the Genoese had formerly exercised over the island, which the Government was ready to publish had not the Marquis de Mirabeau thought fit to destroy it because of its divergence from his own philosophical and economical views. For his services in Corsica Mirabeau was made a captain of dragoons, though not in any particular regiment, and on his return his father endeavoured to make use of the literary ability he had shown for the advancement of his own economical theories. He tried to keep on good terms with his father, though he could not advocate all his ideas, and even went so far in 1772 as to marry a rich heiress, a daughter of the Marquis de Marignane, whose alliance his father had procured for him. He did not live happily with her, and in 1774 was ordered into semi-exile in the country, at his father's request, where he wrote his earliest extant work, the *Essai sur le Despotisme*. His violent disposition now led him to quarrel with a country gentleman who had insulted his sister, and his semi-exile was changed by lettre de cachet into imprisonment in the Chateau d'If. In 1775 he was removed to the castle of Joux, to which, however, he was not very closely confined, having full leave to visit in the town of Pontarlier. Here he met Marie Therese de Monnier, his Sophie as he called her, a married woman, for whom he conceived a violent passion. Of his behaviour nothing too strong can be said: he was introduced into the house as a friend, and betrayed his trust by inducing Madame de Monnier to fall in love with him, and all his excuses about overwhelming passion only make his conduct more despicable. The affair ended by his escaping to Switzerland, where Sophie joined him; they then went to Holland, where he lived by hack-work for the booksellers; meanwhile Mirabeau had been condemned to death at Pontarlier for *rapt et vol*, of which he was certainly not guilty, as Sophie had followed him of her own accord, and in May 1777 he was seized by the French police, and imprisoned by a lettre de cachet in the castle of Vincennes. There he remained three years and a half, and with his release ends the first and most disgraceful period of his life. During his imprisonment he seems to have learnt to control his passions from their very exhaustion, for the early part of his confinement is marked by the indecent letters to Sophie (first published in 1793), and the obscene *Erotica Biblion* and *Ma Conversion*, while to the later months belongs his first political work of any value, the *Lettres de Cachet*. The *Essai sur le Despotisme* was an ordinary but at times eloquent declamation, showing in its illustrations a wide miscellaneous knowledge of history, but the *Lettres de Cachet* exhibits a more accurate knowledge of French constitutional history skilfully applied to an attempt to show that an existing actual grievance was not only philosophically unjust but constitutionally illegal. It shows, though still in rather a diffuse and declamatory form, that application of wide historical knowledge, keen philosophical perception, and genuine eloquence to a practical purpose which was the great characteristic of Mirabeau, both as a political thinker and as a statesman.

With his release from Vincennes begins the second period of Mirabeau's life. He found that his Sophie was an idealized version of a rather common and ill-educated woman, and she speedily consoled herself with the affection of a young officer, after whose death she committed suicide. Mirabeau first set to work to get the sentence of death still hanging over him reversed, and by his eloquence not only succeeded but got M. de Monnier condemned in the costs of