LEONARDO DA VINCI.

"THE world perhaps contains no example of a genius so universal, so creative, so incapable of self-contentment, so athirst for the infinite, so naturally refined, so far in advance of his own and of subsequent ages. His countenances express incredible sensibility and mental power; they overflow with unexpressed ideas and emotions. Michael Angelo's personages alongside of his are simply heroic athletes; Raphael's virgins are only placid children, whose sleeping souls have not yet lived." Thus writes Taine of Da Vinci, in his "Travels in Italy."

Mrs. Jameson calls Leonardo da Vinci, in her "Early Italian Painters," "*The* miracle of that age of miracles. Ardent and versatile as youth; patient and persevering as age; a most profound and original thinker; the greatest mathematician and most ingenious mechanic of his time; architect, chemist, engineer, musician, poet, painter!"

Hallam, in his "History of the Literature of Europe," says of the published extracts from the great volumes of manuscript left by Leonardo, "These are, according to our common estimate of the age in which he lived, more like revelations of

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Red chalk drawing. Library, Turin. (No other contemporaneous portrait of the painter exists.) Drawn by himself.

physical truths vouchsafed to a single mind, than the superstructure of its reasoning upon any established basis. The discoveries which made Galileo, Kepler, Castelli, and other names illustrious — the system of Copernicus — the very theories of recent geologists, are anticipated by Da Vinci within the compass of a few pages, not perhaps in the most precise language, or on the most conclusive reasoning, but so as to strike us with something like the awe of preternatural knowledge. In an age of so much dogmatism, he first laid down the grand principle of Bacon, that experiment and observation must be the guides to just theory in the investigation of nature.

"If any doubt could be harbored, not as to the right of Leonardo da Vinci to stand as the first name of the fifteenth century, which is beyond all doubt, but as to his originality in so many discoveries, which probably no one man, especially in such circumstances, has ever made, it must be by an hypothesis, not very untenable, that some parts of physical science had already attained a height which mere books do not record."

This man, whom Vasari thinks "specially endowed by the hand of God himself," was born in 1452, at Castello da Vinci, a village in the Val d'Arno, near Florence. His father, Piero Antonio da Vinci, was a notary of the republic, a man of considerable property and influence. When he was twenty-five, he married the first of his four wives, Albiera di Giovanni Amadori, in 1452, and

brought home his illegitimate son, Leonardo, born the same year, whom she tenderly cared for as her own.

Of Leonardo's mother, Caterina, little is known, save that five years later she married, presumably in her own circle. Among the twelve other children who came into the home of the advocate, Leonardo was the especial pet and pride, probably because he seemed to have been given all the talents originally intended for the Da Vinci family.

The handsome boy, whose "beauty of person," says Vasari, "was such that it has never been sufficiently extolled," and with "a grace beyond expression," cheerful, eager, enthusiastic, and warm-hearted, when sent to school, learned everything with avidity. "In arithmetic he often confounded the master who taught him, by his reasonings and by the difficulty of the problems he proposed." He had that omnivorous appetite for books which Higginson calls the sure indication of genius.

He loved nature intensely. He studied every flower and tree about the country home; made companions of the river Arno, the changing clouds, and the snow-capped mountains. Passionately fond of music, he not only learned to play on the guitar and lute, but invented a lyre of his own, on which he improvised both the song and the air.

On the margins of his books he sketched such admirable drawings that his father took them to Andrea Verrochio, a famous Florentine artist, who was "amazed," and advised that the youth become

a painter. Leonardo entered the studio of Verrochio when he was about eighteen, and at once became deeply absorbed in his work. He began to make models in clay, arranging on these soft drapery dipped in plaster, which he drew carefully in black and white on fine linen; also heads of smiling women and children out of terra cotta: already he had that divine gift of painting the "Da Vinci smile," which seems to have been born with him and to have died with him. He studied perspective, and with his fellow-students made chemical researches into the improvement of colors.

Verrochio was engaged in painting a picture of St. John baptizing Christ, for the monks of Vallombrosa, and requested Leonardo to paint an angel in the left-hand corner, holding some vestments. When the work was finished, and Verrochio looked upon Leonardo's angel, "a space of sunlight in the cold, labored old picture," as W. H. Pater says, in his "Studies in the History of the Renaissance," Verrochio became so discouraged "because a mere child could do more than himself," that he would never touch the brush again. This work is now in the Academy of Fine Arts in Florence.

About this time, according to Vasari, Leonardo made his famous shield *Rotella del Fico*. "Ser Piero da Vinci, being at his country house, was there visited by one of the peasants on his estate, who, having cut down a fig-tree on his farm, had made a shield from part of it with his own hands,

and then brought it to Ser Piero, begging that he would be pleased to cause the same to be painted for him in Florence. This the latter very willingly promised to do, the countryman having great skill in taking birds and in fishing, and being often very serviceable to Ser Piero in such matters. Having taken the shield with him to Florence, therefore, without saying anything to Leonardo as to whom it was for, he desired the latter to paint something upon it.

"Accordingly, he one day took it in hand, but, finding it crooked, coarse, and badly made, he straightened it at the fire, and, giving it to a turner, it was brought back to him smooth and delicately rounded, instead of the rude and shapeless form in which he had received it. He then covered it with gypsum, and, having prepared it to his liking, he began to consider what he could paint upon it that might best and most effectually terrify whomsoever might approach it, producing the same effect with that formerly attributed to the head of Medusa. For this purpose, therefore, Leonardo carried to one of his rooms, into which no one but himself ever entered, a number of lizards, hedgehogs, newts, serpents, dragon-flies, locusts, bats, glow-worms, and every sort of strange animal of similar kind on which he could lay his hands; from this assemblage, variously adapted and joined together, he formed a hideous and appalling monster, breathing poison and flames, and surrounded by an atmosphere of fire; this he caused to issue

from a dark and rifted rock, with poison reeking from the cavernous throat, flames darting from the eyes, and vapors rising from the nostrils in such sort that the result was indeed a most fearful and monstrous creature; at this he labored until the odors arising from all those dead animals filled the room with a mortal fetor, to which the zeal of Leonardo and the love which he bore to art rendered him insensible or indifferent.

"When this work, which neither the countryman nor Ser Piero any longer inquired for, was completed, Leonardo went to his father and told him that he might send for the shield at his earliest convenience, since, so far as he was concerned, the work was finished; Ser Piero went accordingly one morning to the room for the shield, and, having knocked at the door, Leonardo opened it to him, telling him nevertheless to wait a little without, and, having returned into the room, he placed the shield on the easel, and, shading the window so that the light falling on the painting was somewhat dimmed, he made Ser Piero step within to look at it. But the latter, not expecting any such thing, drew back, startled at the first glance, not supposing that to be the shield, or believing the monster he beheld to be a painting; he therefore turned to rush out, but Leonardo withheld him, saying, — 'The shield will serve the purpose for which it has been executed; take it, therefore, and carry it away, for this is the effect it was designed to produce.'

"The work seemed something more than won-

derful to Ser Piero, and he highly commended the fanciful idea of Leonardo; but he afterwards silently bought from a merchant another shield, whereon there was painted a heart transfixed with an arrow, and this he gave to the countryman, who considered himself obliged to him for it to the end of his life. Some time after, Ser Piero secretly sold the shield painted by Leonardo to certain merchants for one hundred ducats, and it subsequently fell into the hands of the Duke of Milan, sold to him by the same merchants for three hundred ducats."

Leonardo painted also the "Head of Medusa," in the Uffizi Gallery, twined about with green, hissing serpents.

For the King of Portugal he painted a cartoon for a tapestry curtain, — "Adam and Eve in the Garden of Eden." Of the flowers and fruits in this picture, Vasari says, "For careful execution and fidelity to nature, they are such that there is no genius in the world, however godlike, which could produce similar results with equal truth." This cartoon is lost.

The "Madonna della Caraffa," celebrated for the exquisite beauty of the flowers with dew upon them, which stood in a vase by the Virgin, and was highly prized by Clement VII., has also disappeared. The "Adoration of the Magi" and a "Neptune in his Chariot drawn by Sea-horses" were among Da Vinci's works at this time.

He was also studying military engineering, com-

pleted a book of designs for mills and other apparatus working by water, invented machines for dredging seaports and channels, and urged the making of a canal from Pisa to Florence, by changing the course of the Arno, a thing accomplished two hundred years later.

Still he did not neglect his painting. He went about the streets of Florence looking for picturesque or beautiful faces, which he transferred to his sketch-book, always carried at his girdle. He attended the execution of criminals to catch the expression of faces or contortion of limbs in agony. Yet so tender-hearted was he, that, Vasari says, "When he passed places where birds were sold, he would frequently take them from their cages, and, having paid the price demanded for them by the sellers, would then let them fly into the air, thus restoring to them the liberty they had lost."

He loved art. He said, "In the silence of the night, recall the ideas of the things which you have studied. Design in your spirit the contours and outlines of the figures that you have seen during the day. When the spirit does not work with the hands, there is no artist. . . . Do not allege as an excuse your poverty, which does not permit you to study and become skilful; the study of art serves for nourishment to the body as well as the soul. . . . When all seems easy, it is an unerring sign that the workman has but scant ability and that the task is above his comprehension."

Enjoying all athletic exercises; so strong that

he could bend a horseshoe in his hands; exceedingly fond of horses, of which he owned several,— he still found time to be the life and joy of the brilliant society of Florence; always leading, always fascinating with his intelligent conversation and elegant address. And yet the ambitious Leonardo was not satisfied in Florence. The Medici did not encourage him as they did Michael Angelo. Possibly they felt that he lacked a steady and dominant purpose. He finally made up his mind to try his fortune elsewhere, and wrote the following letter to Lodovico Sforza, Regent of Milan: —

"My Most Illustrious Lord, — Having seen and duly considered the experiments of all those who repute themselves masters and constructors of warlike instruments, and that the inventions and operations of the said instruments are not different from those in common use, I will endeavor, without derogating from any one else, to make known to your Excellency certain secrets of my own, and, at an opportune time, I shall hope to put them into execution, if they seem valuable to you. I briefly note these things below: —

"1. I have a method of making very light bridges, fit to be carried most easily, with which to follow the flight of enemies; and others, strong and secure against fire and battle; easy and commodious to lift up and to place in position. I have methods also to burn and destroy those of the enemy.

"2. I know, in case of the siege of a place, how

to take away the water from the ditches, and to make an infinite variety of scaling-ladders and other instruments pertinent to such an expedition.

. . . . . .

"4. I have also kinds of cannon most commodious and easy to carry, with which to throw inflammable matters, whose smoke causes great fright to the enemy, with serious injury and confusion.

"5. I have means, by excavations and straight and winding subterranean ways, to come to any given point without noise, even though it be necessary to pass under moats and rivers.

. . . . . .

"8. When the operations of artillery are impossible, I shall construct mangonels, balistæ, and other engines of marvellous efficacy, and out of the common use; and, in short, according to the variety of events, I shall build various and infinite means of offence.

"9. And when it shall happen to be upon the sea, I have means of preparing many instruments most efficient in attack or defence, and vessels that shall make resistance to the most powerful bombardment; and powders and smokes.

"10. In time of peace I believe I can satisfy very well and equal all others in architecture, in designing public edifices and private houses, and in conducting water from one place to another. I can carry on works of sculpture, in marble, bronze, or terra cotta, also in pictures. I can do what can

be done equal to any other, whoever he may be. Also, I shall undertake the execution of the bronze horse, which will be the immortal glory and eternal honor of the happy memory of my lord your father, and of the illustrious honor of Sforza."

The result of this letter was a summons to the court at Milan, where Lodovico, though dissolute, was proud to surround himself with the most brilliant men and women of the age. Leonardo took with him a silver lyre, made in the shape of a horse's head, designed by himself, on which he played so skilfully that the duke and his court were enchanted. "Whatever he did," says Vasari, "bore an impress of harmony, truthfulness, goodness, sweetness, and grace, wherein no other man could ever equal him." Such a union of gentleness and sincerity with genius! Who could withstand its influence!

At Milan Leonardo remained for nineteen years, and here some of his most remarkable works were done.

One of the first pictures painted for the Regent was a portrait of a favorite, the beautiful Cecilia Gallerani, a gifted woman, skilled in music and poetry. Leonardo painted for her a picture of the Virgin, for which she probably was the model. The infant Saviour is represented as blessing a new-blown Madonna rose, the emblem of St. Cecilia.

The next portrait — it is now in the Louvre — was that of another beauty, loved by the duke, Lucrezia Crivelli, formerly called La Belle Féronnière, who was a favorite of Francis I. "The face," says Mr. Sweetser, "is at once proud and melancholy, with a warm and brilliant coloring and soft pure lines, the head full of light, and even the shadows transparent." In honor of both these portraits Latin poems were written by the poets of the time.

Leonardo also painted two fine portraits of the lawful duke, Gian Galeazzo Sforza, and his wife, Isabella of Aragon, the latter picture "beyond all description beautiful and charming," now preserved in the Ambrosian Library. When these persons were married, Leonardo invented for the entertainment of the guests at the wedding feast a mechanical device called "The Paradise," a representation of the heavens and the revolving planets, which opened as the bride and bridegroom approached, while a person in imitation of the Deity recited complimentary verses.

Leonardo now began on the great equestrian statue of the warrior Francesco Sforza. He studied ancient works of art, especially the equestrian statue of Marcus Aurelius in Rome, made almost countless drawings of horses in repose or on the battle-field, many of which are still preserved at Windsor Castle, studied every movement of live horses and every muscle of dead ones, and did not complete his clay model for ten long years. A genius like Da Vinci spends ten years on the model of an equestrian statue, and yet some artists of the present day, men and women, paint and mould

horses or human beings after a few weeks or months of study, and expect to win fame!

When the clay model was exhibited in public at the royal wedding of the sister of Gian Galeazzo to the Emperor Maximilian, the enthusiasm was very great. All Italy talked of it, and poets and critics extolled it as beyond the works of Greece or Rome. Unfortunately the ensuing wars depleted the treasury of Milan, and prevented the work from being cast in bronze. When the French entered Milan in 1499, it became a target for the archers. Two years later the Duke of Ferrara asked the use of the model that a bronze horse with a statue of himself might be made; but the King of France refused, and the model finally disappeared.

During these years Leonardo founded the Milan Academy. Probably many of the manuscript volumes which he left were notes of lectures delivered to the students. He must have spoken to them on botany, optics, mechanics, astronomy, hydrostatics, anatomy, perspective, proportion, and other matters. He wrote a book on the anatomy of the horse. "He also," says Vasari, "filled a book with drawings in red crayons, outlined with the pen, all copies made with the utmost care from bodies dissected by his own hand. In this book he set forth the entire structure, arrangement and disposition of the bones, to which he afterwards added all the nerves, in their due order, and next supplied the muscles, of which the first are affixed

to the bones, the second give the power of cohesion or holding firmly, and the third impart the motion."

Leonardo said in his notes, "The painter who has obtained a perfect knowledge of the nature of the tendons and muscles, and of those parts which contain the most of them, will know to a certainty, in giving a particular motion to any part of the body, which and how many of the muscles give rise and contribute to it; which of them, by swelling, occasion their shortening, and which of the cartilages they surround. He will not imitate those who, in all the different attitudes they adopt or invent, make use of the same muscles in the arms, back, or chest, or any other parts. . . . It is necessary that a painter should be a good anatomist, that in his attitudes and gestures he may be able to design the naked parts of the human frame, according to the just rules of the anatomy of the nerves, bones, and muscles; and that, in his different positions, he may know what particular nerve or muscle is the cause of such a particular movement, in order that he may make that only marked and apparent, and not all the rest, as many artists are in the habit of doing; who, that they may appear great designers, make the naked limbs stiff and without grace, so that they have more the appearance of a bag of nuts than the human superficies, or, rather, more like a bundle of radishes than naked muscles."

Leonardo irrigated the dry plains of Lombardy by utilizing the waters of the Ticino River, visiting