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Daniele Vare **The Master Mathematician** Temple Bar Magazine, Aug 1901 (but have not been able to relocate it...)

Note: Feynman star ball of hydrogen

He is director of the Roman Observatory, and one of the cleverest and worst-tempered men in Italy, as I, who have studied mathematics under his tuition, have cause to remember. When he traverses the long stone corridors of the observatory on his way to his own special sanctum high up on the telescope tower, the minor clerks, porters and officials fly at his approach like leaves before a storm; and those who have desks or offices which they may not leave, tremble like mice at the sound of his step. He works all night long and most of the day himself, and so he thinks that he is justified in calling everybody lazy by comparison. He is a small man with a pale face, red hair and a squint, which he has acquired by twenty years' nightly use of the telescope. His short, stubbly moustache and long, nervous fingers are stained brown with tobacco juice, for he smokes cigarettes without ceasing from nine in the morning, when he gets up, to four, also in the morning, when he goes to bed. Smoking is in fact his only recreation, unless drinking strong black coffee at all hours of the day and night can be called a recreation. His study is a large, carpet-less room, bare of any ornament, with a few straw chairs, a rickety old sofa, a plain deal table strewn with papers, and books everywhere—in shelves along the wall, on the window-sill, on the floor. The view from the window is the finest in Rome, and the study is also conveniently near the telescopes and the terraced roof. His only companion up there is a very thin and pessimistic tabby, much scarred by fighting, who boasts the extraordinary name of Venus, which is doubly inappropriate, for, besides being the ugliest cat of my acquaintance, Venus is a gentleman! When not engaged in abstruse calculations in his study the master mathematician teaches differential and integral calculus to the youth of Italy at the University. He is a terror to his pupils, to all the other professors, to everybody in the University, in fact, from the director to the man who sweeps out the class- rooms. Yet none of them really dislikes him, and I don't think that even among his colleagues there is anyone who envies him his success. And he can teach—none better! How often have I sat on that old horsehair sofa in his study listening to his words as he strode up and down the room, stumbling over books, barking his shins against the furniture and stopping to swear at it, at me, at himself and the cat all in one breath, yet never losing the thread of his discourse, but talking on easily, fluently, and with an eloquence which lifted one's soul from the petty, sordid thoughts of our everyday life to realms beautiful, incomprehensible, infinite—like the heavens among which he lives and thinks and toils. Sometimes he attends a meeting of the Italian Geographical Society, but I am afraid that his success at these stances is somewhat impaired by his

extreme irritability. For if any one ventures to cast a doubt on the veracity and correctness of his assertions and arguments, he will pitch into that unfortunate individual with a vehemence and a fury entirely undeserved, working himself into such a passion as to become almost inarticulate, when, cramming his old felt hat on to his head, he will shake the dust of the room from his feet and start for home, to the unbounded relief of every- body concerned. Yet with what patience he would receive me in the old days when I used to go to him to be coached up in my mathematical studies, and pushing aside the vast sheets of paper covered with finely written figures and complicated designs that represented the toil of months and years, pick up the work that I had brought him to correct; and, now reproving, now encouraging, now explaining, interest me in spite of myself in the solution of problems which I had, but a few hours before, thrown aside as too dry and tiresome to seem worth considering. Then, after a couple of hours' work, we would stroll out to the flat terraced roof together to watch the sun setting over the broad camp again, while the swallows whirled around us, rising, falling, shooting up into the clear, cool air of the evening, and again sweeping down in long beautiful curves with strange quivering cries and shrill complainings. The Soman Observatory stands in the lower part of the town, but the telescope towers, built by order of the famous Jesuit astronomer Padre Secchi round the dome of the church of St. Ignatius, rise high above their surroundings, so that leaning on the balustrade the vast plain opens out to view on either side: to the west with a faint line as of burnished silver far away on the horizon which indicates the sea, while all around, to north and east and south, the soft purple of the distant hills melts into the lighter blue of heaven. Placed here and there along the balustrade, and fastened down with bands of wire, are several large white ohina dishes or plates; these represent one of the master's hobbies, for every fine evening he goes on to the roof armed with a powerful lens to examine the various particles of dust dropped into the plates by the winds. The south wind or "sirocco" brings the most interesting contributions: grains of sand from Sahara, ashes from Etna and Vesuvius, seeds from Sicilian gardens, which are carefully planted and watered by the master till they bloom out into exotic grasses and flowers. Some of the particles he can recognize at a glance, such as the ashes from Vesuvius or the African sands; others have to be placed with great care under a microscope and examined at length before their origin can be ascertained, and often those that appear most interesting and complex when under the microscope have the most commonplace origin, and are such as could be observed in any large town. I would walk up and down at the master's side when my lesson was over and try (generally in vain) to distinguish one tiny particle of dust from another till the sun went down in the west and the stars began to come out. This would generally be a sign for me to go home, but sometimes he would ask me to stay and keep him company while he worked at the telescopes, and we would climb up the steep staircase of the tower together. The various instruments used in the meteorological observations —hydrometers, meteorographs, and the apparatus for registering the direction and strength of the winds—are placed here and there in the little cells opening out of the corridors and cloisters of the observatory (which once was a Jesuit monastery), and often two or three instruments are crowded into one small room; but the telescope—a huge

column of steel and brass, movable by a complicated system of wheels and pulleys, and with every movement regulated by tiny electric lamps, that light and go out automatically as the observer moves the great tube into position—the telescope stands alone on the highest tower of the building, in the centre of a big circular room, the ceiling and sides of which are made of corrugated iron and are also movable, so that the one high window in the room can be brought into any position necessary for the study of the heavens. After an untidy, hurried and uncomfortable meal brought up by a servant and left to cool till the master should remember its existence, he would begin the night's work, and I would pass the time contentedly enough rolling the iron roof into position for him to examine now one planet now another; sometimes getting a glimpse through the telescope of some gleaming, silvery disc which represented just such another atom of life as this old world of ours, whirling through infinite space to an unknown goal. The master would sit on a high stool just under the telescope, the light of a solitary electric lamp shining down on his head and on the great sheets of paper covered with the manuscript calculations which he used to consult during his observations. Often, carried away by his own thoughts, he would begin to speak of the many theories that men have expounded concerning the stars. He would speak of Jupiter as of a world still in formation, surrounded by gigantic clouds of vapour; of Mars and the problem of its being inhabited by beings similar to men; and once, I remember, he told me about the star that he himself had discovered, and named after his young wife—surely the grandest compliment that ever was paid to a woman by the man who loved her. The hours passed quickly enough up there above the sleeping town; and often the church bells had struck three or four before I went home; now and then our vigils were considerably enlivened by Venus fighting another cat somewhere in the vicinity—generally on the iron roof just above our heads. The master would start from his seat as the first ear-splitting miaow echoed across the roofs, and endeavour to silence Venus by throwing everything that came handy in the direction whence the noise proceeded; if this failed or the sound of broken glass reached our ears, he would seize the handle by which the roof is put in motion and send it round at a rate that must have astonished the combatants, for they generally came down by way of the telescope, their eyes blazing like opals in the darkness. The master was well over forty years of age when I first knew him, and his position in life was assured. He had a wife to look after him and a son in the university for him to look after. But perhaps the days when he was still a young teacher of arithmetic at a little provincial school, with barely sixty pounds a year to live on and everything still to be won, were the happiest of his life. Pasquale, the old school-servant, who remembers him when he first came to Bome to teach mathematics in the Ginnasio, told me that during the five years he spent there he only failed to turn up in class once, and this one occasion is remembered in the Ginnasio to this day. On his promotion to be master of mathematics in the Ginnasio, he had promptly married, and he and his wife lived a simple and very happy life together, though be had to work like a slave to make both ends meet. However, working hard was his forte, so that he had not been in Rome a year before he obtained a small place at the observatory, and almost at the same time his first-born son came into the world. On that eventful day he turned up half an hour late—an unprecedented occurrence for him—and

in such a good temper that he even forgot to scold and storm at the boys who had not done their school task. His pupils stared at each other in round-eyed astonishment, as the faltering excuses of the stupidest boy in the class were received with a good-humoured nod and the cheery remark that it didn't matter in the least. When the midday bell rang and the boys trooped out chattering noisily, instead of striding away to his lunch with his coat tightly buttoned up and his soft hat crammed down over his eyes, he actually strolled out into the garden of the school, picked himself a rose from a tree that grew up the wall, stuck it in his button- hole, and went away jauntily swinging his cane and even trying to whistle the air of the last Neapolitan chansonette, without, however, any marked success. The boys were convinced that the poor man had overworked himself and gone raving mad. The next day, however, the explanation came, and congratulations poured in upon him from his colleagues and pupils, all of which were received with the utmost good humour; one bold spirit even ventured to inquire what name would be given to the dear child, and was promptly invited to come and partake of a glass of vermouth round the corner. The baby was rather a poor specimen of its kind, a puny, white-faced little object, its only beauty being a pair of large wondering brown eyes and a wisp of red hair like his father's. But he, the master, thought it the most wonderful baby in all the world, and worked in his little office at the observatory till he used to faint at his desk, so that his tesoro and its mother might go to Frascati or Albano on the hills near Rome and get the pure country air and grow strong. When it was about ten months old the baby fell ill and the master would come to the school with such a miserable anxious look on his face that his pupils would strive in a clumsy boyish way to console him, and would even endeavour to work a little harder in order to give him less trouble. But after a few weeks he cheered up considerably, and understanding that all was well again they determined to club together and present the master with a bunch of flowers to celebrate his son's first birthday. I don't suppose that it would ever enter an English schoolboy's head to present one of his masters with a bouquet of flowers on any occasion whatever, but the youthful Italian mind is constructed on different principles; all the same the selection of the boy who was to present the flowers gave rise to a considerable amount of quarrelling and chaff, for somehow no one aspired to the honour. At last the auspicious morning arrived, and the boys having temporarily concealed a large bunch of white roses in a desk, sat at their places in the class-room in a state of ill-suppressed excitement, which found vent in a great deal of giggling and various jokes at the expense of the master and his offspring. "He'll be late, you bet," said one small boy near the door," he won't be able to tear himself away from it, now that he can calculate its age by units instead of fractions." "Perhaps he'll bring it here and give it a lecture on geometrical progressions as a birthday treat," said another. "I pity the poor little devil when he grows older," said a third. "Think of having mathematics for breakfast, mathematics for dinner and mathematics for supper! He'll have to draw geometrical figures with his macaroni on the table cloth before being allowed to eat it." Suddenly the door of the class-room opened, but it was the Director of the School who appeared, with a note in his hand to say that the Master of Mathematics was not coming that day, and that the Professor of Latin would take the class in his stead. The boys

groaned aloud. "Confound the silly old fool and his baby," said one of them; "think of having to read Horace for two mortal hours I" Next day however, the roses having been kept fresh in water, the class assembled again, and sure enough, just as the clock struck eight, the master walked into the room and sat down at his desk. The sun streaming through the high glass windows shone down fiercely on his red hair and shabby black coat, worn shiny at the elbows and cuffs; he put up his hand to shade his eyes and began to read out the names from the list which lay in front of him. Each boy, as his name was called, answered: Presente.' and stood up. When this was over a small boy with a very red face and an anxious, worried expression, jumped up with a suddenness that might or might not have been caused by a kick from behind, and, grabbing wildly at the bunch of roses that was put into his hand by the boy who sat next him, began to stammer:—"I—I beg your pardon, sir! But—but we had g—got a bunch of flowers f—for you, I mean your baby—er—yesterday. It, I mean he, was one year old, you know, and if—if you don't mind and it's not too late we would like to offer it, I mean them, to-day." The orator stopped suddenly and shot an anxious glance at the boy beside him, in hope that he would suggest something else to say, but as nobody took it upon himself to prompt, there was silence in class. The master never moved, but continued shading his eyes with his hands. At last he began to speak, and at the sound of his voice the boys gave a start and gazed at him open-mouthed. "I thank you," said the master, and lifting his head picked up a pen that lay close to his hand and absently tried its point on the blotting paper. "I thank you, my young friends, for your sympathy and the kind thought that prompted you to prove it to me so tactfully; I am more grateful than I can ever hope to express for this sign of your friendship and goodwill. You must pardon me if I do not thank you as I should . . . but ... I am not quite myself. I am tired and very miserable. My baby . . died last night." * * *

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The master has another son now, as I said before, a clever, hardworking young man, of whom he is very proud and very fond. There are also a few changes in his appearance, since the days when he taught mathematics; for one thing he is older, and his coat is no longer shiny at the elbows. He has a large apartment in the observatory, worthy of the director thereof, and, as a public official of importance, he has even been presented at Court, on which occasion he appeared for the first time in his life in a top-hat, much to his own apparent discomfort. The old wound however would seem to be not quite healed even yet, for often, as he strolls home from the University to his lunch, he will stop to watch, with a strange expression of longing on his sallow face, some rosy little children being wheeled along the street in a perambulator by their nurse, and he will stand in the middle of the pavement gazing after them till they are out of sight. It is Flammarion's theory, I believe, that to those who pass their lives in the study of realms which are eternal, the events of our human existence appear trivial and petty by comparison; and over two thousand years before Flammarion a psalmist sang in Israel:—

" When I consider Thy heavens, the work of Thy fingers, the moon and stars, which Thou hast ordained; what is man that Thou art mindful of him? and the son of man that Thou visitest him?"

But to the master, who besides his keen intelligence and great store of knowledge possesses a constancy and a fidelity in affection wholly simple and unaffected, no human joy or sorrow will ever seem petty or trivial; for he knows that in all the Universe, where there is life, there also are joy and sorrow to its end.

-Daniele B. Vabe