IN MEMORIA MICHELE LA ROSA

A. SELLERIO

"Nature is always right." I often heard these words when I had the good fortune to be next to Michele La Rosa, while he with «long study and great love» awaited experimental works.

Very simple words, but which contain a profound truth and give us the key to understanding the philosophical mentality, which preceded the research of the Physicist: from those on the fusion of carbon, up to the most recent ones, which made him known in a vast circle intellectual.

Born in Palermo on 26 June 1880, MICHELE LA ROSA he graduated in 1903 and, won by competition for a scholarship, he went for a year at the Royal Higher Institute of Florence, directed by him ANTONIO ROITI. However, notable traces of the short stay remain (List 1, 2). Returning to the laboratory in Palermo at the master, DAMIANO MACALUSO, first as an assistant and then this task, undertaken with ardor a series of works that later to the chair of Palermo left by MACALUSO (1914).

Here he also had scope to explain his brilliant didactic qualities; in the lessons, dragging the audience with the clarity and effectiveness of the exposition, in the laboratory, educating with his example of him to the difficult art of carefully observing and scrupulously experimenting, in which he was a Master.

The reception of various cultural bodies, such as the Accademia dei Lincei and the Society. of the Forty who wanted him partner, the Society of Natural and Economic Sciences of Palermo, the Academy of Sciences, Letters and Fine Arts of Palermo which elected him Vice President and the Royal Prize for Physics, which he had together with Prof. LO SURDO in 1925, mark further stages of the ascent, to which LO scientific work led him.

One of the first topics that attracted your attention, and to which he returned several times, it is the one of the electric shocks. One of the first topics that attracted your attention, and to which he returned several times, and that of the - electric discharges. Noting some peculiarities of the calling arc, he set himself to investigate the nature and recognized that the phenomenon can be produced with completely distinct modalities (List 5, 8, 9); one of which is an ordinary oscillating discharge, the other is an intermittent one, equivalent to opening and closing of impelled valves.

In these researches, I combine with great profit the electrical and spectroscopic methods of investigation (List 8, 9, 18, 20). I was able to obtain many lines of sparks even in the singing arc under the appropriate conditions and thus put it well it is clear that when it discharges the specific power, that is referred to the volume unit, e greater, the degree of spectroscopic excitation is higher; from the arc spectrum, going up the step one arrives at that of spark (List 12). Concerns that well accord with today's views lie the specific potency is the equivalent of the work of ionization.

This parameter, the «specific average power» combined with the spectroscopic observation, will then serve him as a guide come orderly element in all the researches that he will carry out on the arc a reduced pressure, on the glow and on the other forms of discharge; whether it is a question of grasping the particular characteristics of each of them, or, as he preferred, of seeking by which ways one can gradually pass from one to the other form. Notable, among others, is an experience with an aluminum cathode (List 30), which finally shows the influence that the ***metal of the cathode*** exerts, thanks to concomitant photoelectric or thermoelectronic phenomena.

Introducing the energetic concept in the study of discharges, he thought that a higher excitation could also correspond to a higher temperature and since in the singing arc, through the capacitor, one can periodically store energy and hurl it suddenly, he believed he had found the away to get shots of high temperatures; of tempetemperature that is higher than those of the ordinary arc, in which the carbon sublimates.

One could think of a carbon fusion! The authority of the Moissan, who became popular for his brilliant experiences, in which he obtained, using strong pressures, crystallines he recognized for diamonds, would have discouraged anyone else.

But the acute critical spirit of LA ROSA, which, in the face of multiple and unexpected possibilities of nature, he always kept him awake in a certain mistrust of his own and others' theoretical deductions, made him suspect that the MOISSAN had drawn too hastily conclusions and had been hastily accepted (List 12, 13). But the acute critical spirit of LA ROSA, which, in the face of multiple and unexpected possibilities of nature. He always kept him awake in a certain mistrust of his own and others' theoretical deductions, made him suspect that the MOISSAN had drawn too hastily conclusions and had been hastily accepted (List 12, 13). Suppose you have a body of which only a few points are known of melting at high pressures, without knowing neither the whole melting curve, nor the triple

point, nor the sublimation curve. Anyone who is aware of the general trend of the equilibrium curves on the p, T plane, must realize that in the hypotheses made, it may well be that by pushing the temperature forward, melting is obtained without the need to resort to high pressures.

"The question of the fusibility of carbon at ordinary pressure therefore remained open and the decision was left to experience alone". Behind these considerations, he subjected pure sugar coal to the temperature of a singing arc of great power specific and found the signs of a fusion process.

The solid form obtained was that of graphite and this being the only one stable at temperature high, LA ROSA thought that the diamond could be obtained if it were possible to abruptly cool carbon particles as soon as the fusion was obtained.

To this end, he resorted to the spark condensed by a large battery, precisely because in it, but despite the high excitation, the temperature of the electrodes on average remains low and the few particles hit and melted by the discharge can cool down rapidly. He thus obtained very clear microscopic crystallizes, which can well be attributed to the diamond. He did not stop at this success; he dreamed of using lightning, installing appliances on some of the mountains of the Conca d'oro.

The daring thought was not matched by the late means of which it could to dispose and he, eager, as always, to reach complete, clarity and to bring indisputable arguments, resorted to the Joule effect.

If you abruptly throw a strong current into a thin stick carbon, protected by a porcelain capsule, it bursts without any traces of fusion being found; but if the stick has been previously heated until it becomes shining, different characters can be seen both in the fragments and in the splashes on the capsule, which indicate that the fusion has taken place at some point.

Another field of study, in which he gave evidence of great skill experimental and of acumen, was that of the electrical properties of metals. By perfecting and simplifying the research methods, he was able to measure with great certainty and precision the thermoelectric effect and the Peltier effect; in particular, using pure carbon (List 29) which offers special interest, being a strange conductor in many respects, He showed that the behavior of carbon with respect to thermoelectric power is much closer to that of metals than to that of "conductors variables", so that it is inferred that the number of free electrons is little influenced by temperature.

Thus, fully entered into the electronic theory of metals, LA ROSA he was soon attracted by the fascination that arouse the phenomena called electromagnetic second kind by CORBINO, which constituted and still cost the puzzle of every electronic theory of metals. He designed and executed, together with Dr. DE LUCA, experiments which showed that in Hall effect measurements it has an influence on the nature of the secondary electrodes (List 31); and to defend the unitary theory which seemed to him more evident because he ascribes the conductivity only to the work of negative electrons, that is, of the corpuscles found in a variety of ways, he hypothesized that their number and their free and average path were a function of intensity H of the magnetic field. Hypotheses that were set out here and there by others, but to which LA ROSA restored freshness, supporting them with indirect arguments and experiences.

The discovery made by him and by whom falls into this field of research writes of an axial galvanomagnetic effect (List 34). It came thus unexpected, which at first was not believed and was attributed to non-uniformity of the magnetic field. This objection was later fully refuted.

Other researches occupied the activity incidentally or ex professor LA ROSA as the investigation of the astigmatism of vision, the photoelectricity of some liquids, the study of Ruhmkorf's spool; a radioactivity examination led him (List 23) to design and build a very sensitive torsion electroscope with a small capacity, which would deserve the best fortune.

Meanwhile, the sky of physics at the beginning of this century was on its way darkening. As the quanta flashed, the storm unleashed by relativity followed. LA ROSA became passionate. With most physicists, he didn't believe the quanta in their bud; he judged them to be a mathematical effort by the PLANCK to arrive at a formula that accorded with experience at any cost. He, who had a veneration for mathematics - and held a mathematics assignment for chemists for several years, to the great advantage of his students - was distrustful of mathematics, however, when he feared that its mechanism would take the observer's hand and overwhelm him. However, obsequious to Nature and aware of man's ignorance, he surrendered to the tests and exalted quantum theories in his last speeches (List 66, 68, 71), hoping that further processing would be able to dispel the obscurities that still remain.

Much clearer and more decisive is the position that he took in regard of relativity. The memory of the battles from him is too fresh and alive sustained, also in this magazine, so that it is appropriate to briefly expose them. The objections that were raised to him were by his ingenuity converted into arguments in favor; he

arose among the astronomers a fervor of studies that perhaps is not yet extinguished.

To fervent relativists, the ardor explained by LA ROSA may sometimes seem excessive, but a more serene judgment is necessary. It was not a question of accepting the hypothesis of energy steps, which subvert continuity for unknown or inexplicable reasons, but rather of overturning a mental habit, messing up the acquired ideas of space and time.

It is true that the scientist must be ready to change the forms in which contains the representation of the facts, when these prove insufficient, but the change must be profoundly and clearly motivated. The grave defect of the early relativists was to present theory as a mixture of old ideas and forms and new ideas and forms.

Many obscurities, many implications; a very respectable postulate, because extension of mechanical relativity and therefore felt by all, another arbitrary: the constancy of. speed of light, EINSTEIN divination when it was announced, not deduction.

Add to this, as in every revolution, the "excesses of part". Of faced with certain alleged possibilities of rejuvenation and, even worse, of reversals in the random order, LA ROSA used to ask wittily: *In short, is the father or the son born first?*

Fortunately, these abuses are reduced, many misunderstandings have been cleared up. But he, who in a first work (List 21) of 1912 had serenely examined "the experimental foundations of the 2nd principle of relativity" felt how important it was to defend as long as possible the heritage left to us by GALILEO and NEWTON; and he was therefore delighted when in the astronomical argument of DE SITTER, favorable to the constancy of the speed of light and contrary to the hypothesis of RITZ, he managed to find a weak point.

Thus he glimpsed the possibility of maintaining the ballistic hypothesis of the RITZ (the speed of light is added to that of the source) he devoted himself with passion to study the photometric phenomena which should give rise to the periodic motions of the stars; and thus was born that theory of double stars and variable stars which leaves admired for its beauty even those who do not believe in the ballistic hypothesis. One would like this to be true at all costs, to save a theory, so suggestive, which also has a heuristic value: since it was enough for the Author to find, through simple calculations, interesting and strange astronomical facts of which he was completely unaware and of which the " explanation was missing.

The Novae and the Blinksterne appeared to him as pure natural facts; regularities such as Miss LEAVITT's relationship between magnitudes and periods in the Cepheid clusters were easily explained by him. So that, if he were to disregard the experimental tests that relativity has found in other fields and judge the hypothesis ballistics on the testimony of the double and variable stars alone, the balance would tip in his favor; at least, as long as the spectroscopic binaries cannot be examined by far more refined means.

Apart from the refutation of DE SITTER's argument and theory of the double stars, the LA ROSA resolute and intelligent opponent of the relativity, intervening in the discussion with valid arguments, contributed greatly to the clarification of ideas.

It should not be forgotten that in 1912, regarding the "contraction" proposed in the classical context, that is, keeping the inveterate concepts of space and time by FITZ GERALD and LORENTZ, to explain the negative outcome of MICHELSON's experience, he observed: if the two arms of the interface meter had been filled with clear liquids, the shrinking of the arm parallel to movement would depend on the refractive index of the liquid in the other arm, which is absurd to think. So, he cut it short with the hypothesis of FITZ GERALD and LORENTZ.

If this observation had been kept in mind, it would have spared useless attempts at astronomical verifications, aimed at revealing absolute motion through contraction. And therefore, he thought it advisable to return to it recently (List 55).

Although the energy of His spirit was reaching out for battle anti-relativist who strenuously supported, engulfing himself in astronomical study and inciting other scholars, such as Dr. CANNATA., Despite most of his time being subtracted from academic duties or cultural assignments (Higher Council of National Education 1923-25, Presidency of the Faculty of Sciences, organization of the Treccani Encyclopedia, etc.), despite giving the family affectionate care and enlightened who pointed him to the city and to the student population as an example of father and educator, he found the time to deepen among the upper classes the fundamental concepts of physics and discuss the meaning and philosophical value of the new founds; to make the uneducated classes feel the religion of Science and arouse in all the lively interest in the knowledge of Nature. The conferences held at the Philosophical Library of Palermo and the lectures at the University bear witness to this, popular, the speeches.

Clear and persuasive speaker, he thus completed the effective didactic work he carried out daily in the school. And in the broad vision of the tasks that Physics

is called to carry out in the human consortium, he helped the geophysical research undertaken in Sicily, and also collaborated with military technicians in the study of electronic valve devices, which circumstance he gave him the incentive to investigate, together with doctors SESTA and PETRUOCI, singular phenomena which they produce (List 53, 54).

In the full vigor of his strength, when at the University to which he had been appointed Rector, he was waiting for his work of conscious organization, when the walls. of the new Institute of Physics were already ready to welcome instruments and books and a life of research, as, above all, science expected from him what the maturity of ingenuity and the passion and refinement of the physical sense still had to give, death. caught.

A long, severe illness of excruciating pain that he could endure with fortitude equal to the height of the mind, he turned it off on July 6, 1933. The immense crowd of friends, colleagues, citizens who followed the coffin, carried on the shoulders of the students, witnessed the condolences of the whole city. He disappears from the Italian physics scene. One of those men who, fed on classical spirits, know how to look towards the future with prudent advice, but with an ever-young enthusiastic soul.

List of works by MICHELE LA ROSA

1. - Above a Note by A. H. SIRKS entitled “Some phenomena concerning the electrical circuit in electrolytes”. *Nuovo Cimento*, 1903.

2. - On the currents of DUDDEL. *Nuovo Cimento*, 1904.

3. - The PELTIER phenomenon at the neutral point of a thermoelectric couple. *Rend. Lincei*, 1904.

4. - On the measurement of small self-induction coefficients. *Rend. Lincei*, 1905.

5. - The phenomenon of the singing arc in a circuit that does not have its own period of oscillation. *Rend. Lincei*, 1907.

6. - Some graphical representations of the relationships between the period of an oscillating discharge and the inductance, capacity, resistance of the discharge circuit. *Nuovo Cimento*, 1907.

7. - On the function of the capacitor in the induction coil. *Nuovo Cimento*, 1907.

8. - On the spectrum of the light emitted by the singing electric arc. *Rend. Lincei*, 1908.

9. - Transformations of the spectrum of the singing electric arc. *Rend. Lincei*, 1908.

10. - Some new facts about astigmatic and normal eye vision and their interpretation. Note 1. *Rend. Lincei*, 1909.

11. - Some new facts on the vision of astigmatic and normal eyes and their interpretation. Note 11. *Rend. Lincei*, 1909.

12. - Effets termiques de l'are musica; fasion probable du coal. *Comp. Rend. de l 'Ac. d. sc*., 1909.

13. - On the probable fusion of carbon in the singing electric arc and on the spark. *Nuovo Cimento*, 1909.

13 a - The probable fusion of carbon in the musical arc and in the spark. *Trans. of the Faradey Soc*., 1910.

l4. - On the fusion of carbon by means of the JOULE effect. *Nuovo Cimento*, 1910.

15. - On the spectrum of light which accompanies the electric heating of a coal stick. *Nuovo Cimento*, 1910.

16. - The distribution of the concatenated induction flow along the secondary and the choice of the most convenient dimensions for the most important parts of an induction coil. In collaboration with G. PASTA. *Nuovo Cimento*, 1911.

16 a. - Distribution of the induction flux linked to the second blade of a spool. *Nuovo Cimento*, 1911.

17. - Two simple rules for the graphic interpolation between two particular magnetization curves. *Nuovo Cimento*, 1911 ..

18. - Specific power. and the spectral structure in the arc of small intensity. *Nuovo Cimento*, 1911.

19. - On the fusion of carbon by means of the JOULE effect. *Nuovo Cimento*, 1911.

20. - Spectral research on the arc between coals at low pressures. *Nuomo Cimento*, 1912.

21. - Experimental foundations of the 2nd principle of the theory of relativity. *Nuovo Cimento*, 1912.

22. - On an attempt to compare the theory of retativity with the mechanical views of light emission. *Phys. Zeits*, 1912, p. 1129.

22 a. - Above an experience of comparison between the theory of relativity and the mechanical concepts on the emission of light. *Gior. of Natural Sciences ed. Economic, Palermo*, 1912.

23. - A torsion electroscope for radioactivity measurements. *Nuovo Cimento*, 1913.

24. - On the change in the activity of a sample of uranium nitrate. *Nuovo Cimento*, 1913.

25. - Researches of photoelectricity on some liquids. In collaboration with V. CAVALLARO. *Nuovo Cimento*, 1913.

26. - Around "relativity" in physical phenomena. *Gior. of Natural Sciences and Economics, Palermo*, 1914.

27. - Arc and spark. Reliefs above a Note by prof. A. OOCHIALINI. *Rend. Lincei*, 1915.

28. - About the alleged fusion of carbon obtained by A. LUMMER. Critical observations and new experiences. *Nuovo Cimento*, 1916.

29. - The thermoelectric effect in the coal-platinum pair. *Nuovo Cimento*, 1916.

30. - Arc and glow. *Nuovo Cimento*, 1916.

3I. - Over the influence that the nature of the secondary electrodes can have in the measures of the HALL effect. *Nuovo Cimento*, 1918.

32. - Thermoelectric power and resistance of bismuth in the magnetic field. *Nuovo Cimento*, 1919.

33 - A comparison between the electronic theory of metals and experience. *Nuovo Cimento*, 1919.

34. - M. LA ROSA and A. SELLERIO. Effect galvanomagnétique parallel aux lignes de force et normal au courant. *Compt. Rend*., 1920.

35. - Conductivity and thermoelectric power in the magnetic field according to electronic theory. *Rend. Lincei*, 1921.

36. - The phenomena of "variable stars" as proof of composition of the speed of light with that of the source. *Rend. Linceri*, 1923.

37. - Does the speed of light add to that of light? Evidence for this from the phenomenon of the "variable stars". *Zeit. fur. Phys*. Band. 21. 1924.

38. - Astronomical evidence contrary to "relativity". New theory of variable stars. *Nuovo Cimento*, 1924.

39. - The constitution of the variables of the "Mira Ceti" type according to the ballistic hypothesis on the speed of propagation of light. *Rend. Lincei*, 1924.

40. - The Doppler effect and the ballistic principle about the speed of light. *Astr. Nachr.* No. 5319, vol. 222, 1924.

41. - Doppler effect and ballistic theory of light. *Astr. Nachr*, 1924, N. 5336.

42. - The Ballistic Theory of Light and Michelson-Morley Experiment. *Nature* 1924.

43. - Radial velocities and ballistic theory of variable stars. *Rend. Lincei*, cci, 2 seed 1924.

44. - On the experimental foundations of the ballistic principle on the speed of light. *Rend. Lincei*, 1925.

45. - Around some objections against the ballistic theory of variable stars. *Memoirs of the Italian Astronomical Society*, Vol. III, 1.925.

46. - The ballistic principle on the speed of light and some recent research by Mr. Rudolf Tomaschek. *Rend. Lincei*, 1 sem. 1924.

47. - On the interpretation of the behavior of ALGOL and on the variability of the speed of light. *Rend. Lincei*, 1929.

48. - New contribution to the ballistic theory of "variable stars". Explanation of the phenomenon, for U. Geminorum and Clustertyp stars. *Memoirs of the Italian Astronomical Society*, Vol. IV, 1928.

49. - New proof of the influence of the motion of the source on the speed of light. Ballistic explanation of Miss LEAVITT's law. Note 1. *Rend. Lincei*, 1931.

50 - New proof of the influence of the motion of the source etc. Note 11. *Rend. Lincei*, 1 sem. 1931.

51. - On the ballistic propagation of light. New theory of variable stars. *Proceedings of the lnternaz Congress of Physicists, Como*, September 1927.

52. - Astronomical evidence in favor of the Ballistic Principle of the velocity of light to generate the theory of the "Variable stars". *Phys. Laboratory University Palermo*, 1925.

53. - A two-valve circuit emitting discontinuous wave trains. In collaboration with L. SESTA. *Rend. Lincei*, 2 sem. 1930.

54. - A circuit emitting discontinuous wave trains. In collaboration with G. PETRUCCI. *Rend. Lincei*, 2 sem. 1930.

55. - On the alleged reality of LORENTZ's contraction and on the determination of the absolute motion of the earth. *Rend. Lincei*, 2 sem. 1932.

Conferences and disclosures.

56. - On the artificial production of the diamond. *Magazine of Italy*, 1909.

57.—*The Aether-History of a Hypothesis*. Published by J.A. Barth. Leipzig 1912.

57 a. - History of a hypothesis. The "Aether". *Filos Library Yearbook. Palermo*, 1912.

58. - The modern views of physics and their relationship with the other sciences. *Palermo*, 1912, Stab. Tip. Virzì.

59. - The degradation of energy. *Logos*, vol. 11, 1915.

60. - The constitution of matter according to the concepts of current physics. Prolusion to the official physics course. *Yearbook of the Royal University*, 1915.

61. - The electronic theory of metals. *Scientia*, vol. XXVII, 1920.

62. - The theory of relativity in the face of experience. (Proof to the contrary offered by astronomy). *Proceedings of the V International Congress of Philosophy*, 1924.

63. - The ballistic hypothesis on the speed of light. Fundamentals, difficulties and consequences. *Proceedings of the Soc. It. for the Advancement of Sciences*, 1924.

64. - Astronomical evidence contrary to relativity. Part 1 and 11. The "variable stars". *Scientia*, 1924.

65. - The II *Triennial Congress of the International Astronomical Union. Scientia*, 1926.

66. - Quantum theory and electromagnetic theory of light. *Proceedings of R. Acc. Sciences, Letters and Fine Arts*, vol. XIV, Palermo, 1926.

67. - Heat and electricity. *Special issue of "Electricity"* published on the l centenary of the death of Alessandro Volta, 1929.

68. - From a law of "Physics" to a possible general view of social phenomena. Inaugural speech of the Academic Year 1928-29 of the *R. Acc. Of Sc. Lett. And Fine Arts, Palermo*, vol. XV.

69. - The concept of time in EINSTEIN's theory. *Memorie della Società Astronomica ltaliana*, 1929.

70. - Notes on the magnetic apparatuses used for geophysical explorations. *Bull. Ass. Min. Sicilian*, n. 1- 3, 1930.

71. - Give the atom to the waves. *inaugural speech* in the R. University of Palermo for the Academic Year 1930-31.

72. - Some general information on magnetism and geomagnetism useful for understanding magnetic prospecting research. *The Universe*, year XIII, n. 7, 1932.

73. - Report read for the *inauguration of the Academic Year 1932-33* in the capacity of Magnificent Rector of the Royal University of Palermo.

Publications by M. La Rosa*

Astr. Nachr.	Astronomische Nachrichten
Compt. Rend.	Comptes Rendus de l'Académie des Science
Nuovo Cimento.	Nuovo Cimento, Il
Phys. Zeits.	Physikalische Zeitschrift
Rend. Lincei.	Atti della Reale Accademia Nazionale dei Lincei. Rendiconti Lincei.
Scientia	*Science*
Zeit. fur. Phys.	Zeitschrift für Physik

*[EDITOR: Adds info full name]

Italian to English translation using Google Translate and Yandex Translate by Thomas E. Miles. Other Ritz & La Rosa related files located by Robert Fritzius at web site: http://shadetreephysics.com/ with other relating at Gen. Sci. Journal: https://gsjournal.net/