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“Nec araneorum sane textus ideo melior quia ex se fila gignunt, nec noster vilior quia ex alienis libamus ut apes.” *Just. Lips. Monit. Polit. lib. i. cap. 1.*

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necessary to be kept in view in order to obtain a correct analysis.—
Poggendorff's Annals, 1836, No. 2.

NOTICE OF THE LIFE AND CONTRIBUTIONS TO SCIENCE
OF THE LATE M. NOBILI.

The following notice of the scientific labours of M. Nobili, from the pen of Professor A. de la Rive, is translated from an article in the *Bibliothèque Universelle*.

“ It is with a feeling of the deepest grief that we announce the loss which science has recently experienced in the person of the Chevalier Leopold Nobili of Reggio. This distinguished natural philosopher died at Florence, on the 5th [17th?] of August 1835, at an age which gave the hope of a still longer continuance of his life: it appears that he sank under an affection of the chest. This loss, felt by all the learned world, is especially so by the editors of the *Bibliothèque Universelle*, to which M. Nobili was in the habit of consigning his important researches. Our journal has had the advantage of making known the first labours of the learned Italian, and of publishing thenceforward successively all the others. We therefore believe that we obey a sacred duty, and discharge the debt of a very natural gratitude, in endeavouring to recall in a few words the principal services which M. Nobili has rendered to science.

“ After having occupied himself with investigations respecting magnetism and light, purely theoretical, M. Nobili began in 1825 to devote himself to experimental researches. He commenced by inventing the galvanometer with two needles, which has since rendered such great services to experimental philosophy, and which has been generally adopted; its description will be found in the *Bibliothèque Universelle*, vol. xxix. p. 119. More recently, he added to this first invention that of the comparative galvanometer. But the series of investigations which in an especial manner made M. Nobili known to the learned world, was that relative to the colours developed upon metallic plates acting as poles in the electro-chemical decomposition of different solutions. The discovery of this brilliant phenomenon, the study of all the circumstances which accompany and modify the production of these coloured rings, were the object of two important memoirs, which, inserted at first in vols. xxxiii. and xxxiv. of the *Bibl. Univ.*, were afterwards republished in most of the scientific journals.

“ It was while pursuing the examination of this subject, that M. Nobili succeeded in demonstrating the cause of the electro-chemical motions of mercury, (*Bibl. Univ.* vol. xxxv. p. 161,) and in discovering in the de-formation which the coloured appearances undergo in certain cases, the existence of a reciprocal action exerted by electrical currents, and analogous to the *interference of luminous rays*. (*Bibl. Univ.* vol. xxxvi. p. 3.) Some years later, he resumed the questions which related to the form and the production of these electro-chemical appearances, and succeeded in employing them as a valuable criterion to follow the elementary electrical currents in their progress,

their distribution, and their mode of grouping. He thus deduced from them important consequences respecting the interior mechanism of the pile, and the manner in which electricity distributes itself in it. (*Bibl. Univ.* vol. lvi. p. 150.)

“ Whilst studying the electro-chemical appearances, in reference to the light which they might throw upon everything connected with the electric current, M. Nobili did not neglect to consider them independently, and with a view to the applications to the arts which they might present. He has described in a long memoir (*Bibl. Univ.* vol. xliv. p. 337, and vol. xlv. p. 35,) the series of processes by which he succeeded in constructing, by means of the electro-chemical appearances, a chromatic scale which presents every degree and all the different blendings of colours; this essay also contains many ingenious views respecting the theory of colours in general*. We cannot terminate what we have to say concerning this part of M. Nobili's researches, without again insisting on the beauty and variety of the colours which are obtained by the method which he has devised; we will add, that their permanency appears to us truly remarkable, and we do not doubt that sooner or later art will possess itself of the process, and derive great advantages from it. As to the cause of the phenomenon of the electro-chemical appearances, the learned Italian has scarcely occupied himself with the question; but it appears to us beyond doubt, that they are owing to a very strongly adherent deposition formed on the metallic plates, by excessively thin films of the substances decomposed by the electric current: this point, however, merits investigation.

* The analysis of the electro-physiological effects, obtained when a frog forms part of the circuit, and of the consequences in relation to animal electricity which may be drawn from them, was the object of laborious researches on the part of M. Nobili. (*Bibl. Univ.* vol. xliv. pp. 48 and 165.) He had already shown in a preceding essay, entitled ‘*Comparison between the two most sensible Galvanometers, the Frog, and the Multiplier with two needles,*’ (*Bibl. Univ.* vol. xxxvii. p. 10,) that the frog may give rise, by itself and without any external agent, to an electrical current†; he had studied the direction of this current, and the circumstances which modify its direction and its intensity. But in the memoir which we have first quoted, he had deeply studied the phenomena which result from the combined action of the current of the frog and the external currents, and he had arrived at remarkable results respecting the influence of the direction of these last currents, in reference to the effects upon the animal economy which result from them. He lately returned again to this subject, (*Bibl. Univ.* vol. xlvii. p. 174,) less for the purpose of adding new facts to it, than to combat M. Marianini, who was also engaged in this question, but who had arrived at entirely different results. We confess that we do not conceive why such dif-

* A translation of M. Nobili's Memoir here noticed, will be found in the *Scientific Memoirs*, Part I., published on the 1st of August.—EDIT.

† Had not this been shown long ago, quite early in the history of Voltaic electricity?—EDIT.

stinguished philosophers as Messrs. Nobili and Marianini have devoted so much time to researches of so little general interest, and in which it is so difficult to arrive at any precise and well-determined result, and we even regret that they have done so.

“ In the memoir which we have cited above, (*Comparison, &c.*) and in a subsequent note, (*Bibl. Univ.* vol. xxxvii. p. 174,) M. Nobili had cited several remarkable experiments on the development of electric currents by chemical action, and on the laws of this development. He had placed beyond doubt the fact, disputed by Davy, of the production of electrical currents by chemical action, and had shown this production, in the case of simple solutions and double decompositions, as well as in the others. He had found no relation between the intensity of the currents obtained, and the intensity of the chemical action, or the electric nature of the combined elements. But having obtained sensible currents by applying heat to liquid or humid bodies (such as moistened clay), he had thence concluded that the electric currents developed in chemical action, are owing to the heat which always accompanies it. Pursuing this idea, he developed it more completely in a memoir, entitled ‘*On the Nature of Electric Currents.*’ (*Bibl. Univ.* vol. xxxvii. p. 118.) In this paper, the author successively passes under review the currents which take place without chemical action, or the *thermo-electric* currents, and those which are accompanied by chemical action, or the *hydro-electric* currents. While occupying himself with the first, he carefully studies the case when the circuit contains only a single metal, that in which it contains two, that in which the circuit is humid, that in which it is mixed: in these two last cases, the current appears to him to proceed always from the hot to the cold part; in the two first this law appears to suffer exceptions. In the examination which he makes of the electric currents, M. Nobili finds also that the electric effects follow the course of the heat, more sensibly in the cases in which one of the elements is solid, because the heat is concentrated in it, than in the case when both are liquid, because the heat is there disseminated. Summing together all the proofs of the identity of caloric and electricity, he finally arrives at the conclusion, that the electric current is only caloric in motion. The inverse conclusion might with equal reason have been arrived at, that caloric is only electricity in motion; the truth is probably neither in one nor the other of these two identities, round which philosophers have, as it were, for a long time revolved. Singular weakness of the human mind, which, because effects resemble each other, absolutely requires that one be the cause, the other be the effect, as if they could not both depend on a more general cause common to both!

Whatever be the judgement awarded respecting the merit of the theory which we have just called to mind, the memoir of M. Nobili will remain not less remarkable, from the curious facts with which it has enriched science. Thenceforward, the subject of thermo-electric currents never ceased to occupy the learned Italian: he especially succeeded in making the thermo-electric pile the most sensible of thermoscopic instruments. His first attempts of this kind are

recorded in the *Bibl. Univ.* vol. xlv. p. 225 ; more recently, in conjunction with M. Melloni, he has exemplified, by researches on the passage of radiant caloric through bodies, all the advantage that might be obtained from this new instrument placed in the hands of experimental philosophers. It is well known to what admirable discoveries M. Melloni has since made it subservient ; but we ought not to forget that we owe the first idea to M. Nobili.* Recently again (*Bibl. Univ.* vol. lvii. p. 1,) he has published, accompanying it with some curious results, a description of two new forms of the thermo-electric pile, adapted to augment its degree of sensibility, already very great, and to suit it to certain calorific researches, for which it could not be used in its original form.

“ M. Nobili had also made some investigations relating to magnetism (*Bibl. Univ.* vol. lvi. p. 82) ; he had studied in particular the magnetic state which is frequently imparted to the wires of a galvanometer by the vicinity of magnetized needles. But he paid particular attention to the phænomena of the currents developed by the induction of magnets. At the first news which he received of Mr. Faraday's discovery, he set to work with M. Antinori to explore this new and curious subject, (*Bibl. Univ.* vol. xl. p. 127.) These two experimentalists obtained, like Mr. Faraday, all the effects of electric currents, by employing solely the induction of a magnet ; they especially succeeded in thus producing the electric spark, and in demonstrating that M. Arago's experiment of the rotating disc is satisfactorily explained by means of the electric induction of magnets †.

“ M. Nobili was besides lately engaged in various interesting researches : we have before us a memoir by him, dated the 25th of January of this year, the first part of which we insert in the present Number of the *Bibl. Univ.* ; its subject is ‘ *the distribution and effects of electric currents in conducting bodies.*’ We are not aware that he has since finished any other labours ; if, however, it should be other-

* Translations of the first two memoirs, by M. Melloni, on the trans-
 mission of radiant heat have been given in Part I. of *Scientific Memoirs* ; and
 the series will be continued in Part II., which will be published on the 1st
 of November next.—EDIT.

† We must beg leave to express our dissent from the representations
 made by M. de la Rive, on these two subjects. In *Phil. Mag. and Annals*,
 N. S. vol. xi. p. 401, will be found a translation of a paper by MM. No-
 bili and Antinori, “ On the Electro-motive Force of Magnetism,” with notes
 by Mr. Faraday, in which it is shown, that M. Nobili and his coadjutor
 obtained the electric spark from a common magnet before Mr. Faraday had
 obtained it, simply in consequence, to use their own words at the con-
 clusion of their paper, of their having “ entered into a path before they knew
 all the steps taken in it by the illustrious philosopher who threw it open.”
 After Mr. Faraday had discovered the means of eliciting the spark from the
 electro-magnet, to obtain it from the common magnet was a direct con-
 sequence of that discovery. Mr. Faraday also shows in these notes, that
 MM. Nobili and Antinori had altogether mistaken the character of the
 acting causes in Arago's experiments, the true theory of which he had him-
 self, in fact, fully developed. A more detailed statement on this latter sub-
 ject will be found in Mr. Faraday's letter, to M. Gay-Lussac, in the *Annales
 de Chimie et de Physique*, vol. li. pp. 404, 409, &c.—EDIT.

wise, we shall hasten to publish whatever other researches have been made by this skilful philosopher.

“ In recapitulation : during the ten years of his life which M. Nobili devoted to the sciences, he was principally occupied with electricity and magnetism, and the results of his numerous and interesting researches in this department of physics may be arranged under the following heads :—

“ 1st, The improvement of galvanometers and the invention of the thermoscope-multiplier.

“ 2ndly, The discovery of the electro-chemical appearances upon the metallic poles, and the study of the distribution of electric currents.

“ 3rdly, Investigations relating to electro-physiological phenomena.

“ 4thly, Researches relating to the production of electricity by heat and chemical action, and to the relations which subsist between these two modes of developing electricity.

“ 5thly, The study of magnetism, and more particularly of the production of electric currents by the induction of magnets.

“ After having been momentarily interrupted in his labours by the events of 1831, M. Nobili resumed them, not long after, with renewed activity. Placed in that Museum of Florence in which the Academicians del Cimento performed their experiments; having at his disposal all the resources which this city, so worthy of the recollections which it excites, presents; honoured by the favour of a prince, at the same time the distinguished amateur and enlightened friend of the sciences; surrounded by cooperators of the highest merit, what would not M. Nobili have done? he whom we had seen, after a youth devoted to the military profession, notwithstanding the little assistance offered him by his native city, acquire in five years the scientific reputation which he enjoyed in 1830. Alas! why was it that a premature death came to destroy hopes so well founded, and to deprive physical science, which numbers so few at present, of one of its most able and devoted followers!

“ A. DE LA RIVE.

“ Geneva, 30th September, 1835.”

We add the subjoined particulars from a notice of M. Nobili, by M. Matteucci, also given in the *Bibliothèque Universelle*.

“ To trace the eulogium of so celebrated a philosopher as M. Nobili, is to write one of the brightest pages in the history of electricity; is to remind Europe, that in the country of Volta the germs of science cannot disappear; is to render homage to the prince who knew how to appreciate his labours, patronize his researches, and honour his mortal remains; it is also to discharge a debt arising from a high admiration for so many remarkable discoveries, and a sincere friendship, which encouraged me in my first steps in science, a friendship which very different scientific occupations have not since been able to change.

“ Born at Transilico (Garfagnana, Ducato di Modena) in 1784, M. Nobili received his first scientific education in the military school of Modena; it was there also that his talents for the physical sciences began to develop themselves. Carried away in the military move-

ment which swept over Italy, as well as the rest of Europe, he became Captain of Engineers, and he received on the field of battle, from the hands of the Emperor Napoleon, the Italian decoration.

“It would be difficult to describe the energy with which he related to me one day, whilst walking on the banks of the Arno, the whole of his military life, and particularly all the sufferings to which he was a prey during the too celebrated Russian campaign.

“Order and peace restored M. Nobili to his first studies, as they restored to them, by a remarkable coincidence, a man who has followed a similar route in science, M. Becquerel, who had also been Captain of Engineers.

“Appointed Professor of Natural Philosophy in the Museum of Florence, that establishment to which his celebrated friend and countryman M. Amici is attached as Astronomer, M. Nobili gave during two years, to a numerous auditory, lectures at once correct and full of new views. It is by his cares, and by those of the director of the establishment, that, thanks to the munificence of the sovereign, the *cabinet de physique* has become one of the first in Europe, particularly with respect to the history of science.

“M. Nobili was one of the forty of the Italian Society, a corresponding Member of the Royal Academy of Sciences at Paris, and of several other learned bodies; he died August 17th, 1835, of a slow *entréglite* under which he had suffered for a long time.

“A man of courage and rectitude, always lively and brilliant in his private conversation, a skilful experimentalist, a learned philosopher, he left in his friends, in the friends of Italian glory, a deep grief to have seen him so soon snatched from their friendship and from science.

“The Grand Duke of Tuscany has ordered a monument to be raised to M. Nobili, by the side of the most illustrious Italians, in the church of Santa Croce, the Italian Pantheon. Honour to the prince who thus knows how to appreciate real merit !”

METEOROLOGICAL OBSERVATIONS FOR JULY 1836.

Chiswick.—July 1—4. Very hot. 5. Excessively hot: thunder at night. 6. Thunder, which in London and its immediate neighbourhood was accompanied by hail of large dimensions: the latter, as also the lightning, did considerable damage. 7—11. Very fine. 12. Rain: very fine. 13, 14. Very fine. 15. Cloudy. 16—18. Fine. 19. Rain. 20. Showery and cold: highest temperature in the day 35° lower, in the shade, than that on the 5th. 21. Fine: thunder showers: hail in some parts of the country. 22—26. Cloudy and fine. 27. Overcast: lightning at night. 28. Very hot. 29. Heavy rain: stormy at night. 30. Showery. 31. Cloudy and fine: rain.

Boston.—July 1. Fine. 2. Cloudy. 3—5. Fine. 6. Cloudy: rain early A.M. 7—9. Fine. 10. Cloudy. 11. Fine. 12. Cloudy: rain early A.M. 13. Fine. 14. Cloudy. 15. Rain. 16. Cloudy: 17, 18. Stormy. 19. Cloudy. 20. Rain. 21. Cloudy: rain A.M. and P.M. 22. Cloudy: rain P.M. 23. Fine: rain P.M. 24. Rain. 25. Cloudy: rain A.M. and P.M. 26. Cloudy. 27. Cloudy: rain early A.M. 28. Fine. 29. Cloudy: rain early A.M.: rain P.M. 30. Cloudy: rain early A.M. 31. Fine.