# 3.4 IN "MECCANICA"

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***ENNIO DE GIORGI (1928–1996),***
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Ennio De Giorgi was one of the greatest mathematicians of this century. Born in Lecce, from a family rooted in cultural traditions, he showed a precocious intelligence from early in his childhood. His youth was unusual, instead of playing, he preferred to walk in the countryside, collect stones, and observe the plants, wasps, and ants. At school he revealed such a surprising mathematical talent that his teacher, a priest, soon predicted the success of his extraordinary student in the field of mathematics. After highschool, De Giorgi entered the faculty of mathematics at Rome, where he followed the courses delivered by Picone, Severi, and Krall. Remarkably, at the end of his second year, during his Summer vacation in Lecce, he generalised, almost by exercise, the classic notion of integral, rediscovering on his own the Lebesgue integral. This astonished Picone, who immediately offered De Giorgi a position as research assistant on completion of his university studies.

Following his graduation in mathematics, De Giorgi's professional reputation grew very quickly. Winner of a chair in Mathematical Analysis at Messina in 1959, he was called by Faedo to Pisa, first at the University and then to the Scuola Normale, where he remained for the rest of his life. During this period he began to develop his extensive sequence of impressive results: a theorem on regularity of extremals in the calculus of variations for multiple integrals; a counterexample in the Cauchy problem for differential equations; the regularity properties of minimal surfaces; a new theory on perimeters; the theory of $G$–convergence and $\Gamma$–convergence; the variational theory of functionals simultaneously defined on volumes and surfaces; the evolution theory of minimal surfaces depending on a parameter; and, finally, in these last years, a generalisation of gravitational theory.

It may appear that such a profusion of contributions would have excluded De Giorgi from other scientific interests. But he also worked in logic. Convinced that the classical notion of a set is too restrictive, he began to enlarge the class in which to collect concepts according to the wider notions of quality and relation. While such generalisations were not new among logicians, De Giorgi's merit was of introducing in these new notions an algebra having the same rigour as that of sets. Another area of logic reconsidered by De Giorgi was that of the minimum number of axioms of a theory. If an additional axiom, though superfluous, renders a theory more accessible, why not employ it?

De Giorgi also had an extraordinary civil vocation. He was interested in politics, and, in particular, in the debate betwen statesmen and parties. However, he observed them with the same detachment, appropriate to an

entomologist, with which he had, as a child, observed ant–hills. Conversly, he passionately intervened in all cases in which the rights of man were violated. He collaborated with 'Amnesty International', and often personally collected signatures and wrote letters denouncing statesmen in Argentina, Chile, Uruguay, Russia, South Africa, when he became aware of some transgression. He was a catholic, but was never known to impose his faith as a conditioning argument in either a public or private discussion. Only occasionally did De Giorgi speak, among his friends, of faith–related issues. On those occasions, it was the Old Testament, book of Wisdom, which was his most frequent source of quotations, and not the Gospel.

The way in which De Giorgi reasoned, both in mathematics and in everyday matters, was surprising for its simplicity. When faced with a difficult mathematical problem, often posed by his students and colleagues, he would immediately begin to reduce it to its most elementary and essential terms. If it concerned a difficult partial differential equation, he would first consider the one–dimensional case, or he would suggest the rotationally symmetric case as to reduce the number of independent variables. However, having analysed some particular simplified cases, he would then not hesitate to formulate audacious guesses, and his conjectures were famous. In political questions he also reduced problems at the essence. The sovereign principle is avoid any kind of conflict, but to resolve this with a peaceful discussion.

De Giorgi's figure shows a surprising analogy with that of Leibniz. Both were endowed with a deep religious faith and passionately committed to the improvement of society (Leibniz made an attempt to conciliate Catholics and Protestants). Both had a genial talent for mathematics and logic. Both had an ordered vision of what appears, as a manifestation of the hidden harmony of the universe. On the other hand there were some essential differences between the two. Leibniz was even more versatile, because he was also an alchemist, engineer, historian, and man of the world, often busy (as Russel writes) at pleasing princes. De Giorgi did not have such tendencies for mundanity, because, although he received awards and prizes everywhere he seemed to ignore them.

The heavens themselves blaze forth the death' of a great man, as Shakespeare says. But, in De Giorgi's circumstance, our hearts burn with bitterness for the premature loss of a mind whose further unrealized contributions would yet have advantaged the development of science.