By the time Darwin arrived in Italy with Giovanni Canestrini's translation of *The Origin,* transformism had already reached Piedmont from nearby France bringing with itself a Lamarckian imprint. It had been introduced by Franco Andrea Bonelli (1754-1830) whom the great anti-Lamarckian naturalist Georges Cuvier appointed to the chair of Zoology at the University of Turin. Bonelli held the direction of the Museum of Natural History in that city from 1811 to 1830. He had been a pupil of Lamarck and Geoffroy Saint-Hilaire. His own pupils later were Carlo Lessona (father of the better known Michele) and the entomologist Vittore Giuliani. From these the Turin group of evolutionists developed and was active in the late '800s and early '900s under the leadership of Daniele Rosa (1853-1944)[1].

Eminent members of the Turin group were count Mario G. Peracca, Michele Lessona, Lorenzo Camerano, Ermanno Giglio Tos[2] and Giuseppe Colosi[3]. Under Rosa's influence, and more particularly under that of count Peracca, Léon Croizat (1894-1982), born and brought up in Italy by French parents, was to receive his training. *Rivista di Biologia/Biology Forum* devoted a monographic issue to him (**81**/4 - 1988). The school of Rosa had a following in Italy up until the second world war while Croizat remained largely unknown, though his influence was felt abroad, particularly in New Zealand (cf. Robin Craw, in the quoted issue). The astronomer G.V. Schiaparelli (1835-1810), who attended Turin University, also propounded a topological approach to morphogenesis, unrelated with the Selectionism favoured in Britain. At mid-century, with the emergence of a world-wide neo-Darwinian school

[1] Cf. Antologia della Rivista di Biologia, *Riv. Biol./B. Forum* 92 (1999), p. 407.
[2] *Ibid.,* p. 403.
[3] *Ibid.,* p. 377.

deriving from the English speaking world, the Turin circle became a historical relic, though some of its ideas did come be taken up in other continents (cf. E.K. Balon, *Riv. Biol./Biol. Forum* **81** (1988): 213).

Under the influence of Lamarck and Naegeli, Rosa built up a theory of Evolution governed by "internal forces" where species development was likened to the development of the individual, which unfolds as a destiny there from the start. Such an evolution "on the entire (ὅλος) front" was given the name of "Hologenesis". Due less to a lack of naturalistic evidence, hologenesis came to nothing because it had no genetic nor molecular mechanism on which to rely. Chance mutation allied with natural selection offered instead a simple model for the local origin of species, spread by diffusion from "centers of origin". Conceivably the recent discoveries on horizontal heredity and on epigenetic variations will be able to provide hologenesis with a molecular model.

It was Léon Croizat who in recent times developed and took to greater depth hologenesis – with his theory on the distribution of plants and animals, to which he gave the name of "Panbiogeography" (Croizat dedicated his most important work to Rosa). What J.D. Hooker (1859) had observed, in Darwin's time, and Croizat had explored on his journeys around the world, was that distribution of species is not correlated with their dispersion means (Hooker's paradox). Taxonomically related groups are to be found in territories distant from each other and impossible to reach because of unsurmountable "barriers" which separate them. Flightless birds (Ratitae) are to be found in South America (nandù), South Africa (ostrich), Australia (emù) and New Zealand (kiwi) where they mostly appeared in the Pliocene-Pleistocene some three to seven millions years ago, the continents however, having separated more than forty millions years ago. According to panbiogeography their undifferentiated ancestor was once (mobilism phase) wandering across the southern part of Pangea. Later, distinctly and in parallel (immobilism phase), the subgroups differentiated into similar forms. Such a picture involves hologenetic evolution, from an undifferentiated taxon, in the direction of subtaxa that are similar but distinct – the "vicariant' groups. Evolution of the original taxon was precluded by its very mobility

and mixing; evolution of the derived taxa was made possible by their immobility and isolation.

The emergence in parallel of similar forms separated by distances that none could traverse and in some cases by long eras, is met with also in the prehistory of human culture. Gigantic pyramidal monuments have been discovered in all continents. The first traces of the domesticated dog have been found at Star Carr in Yorkshire and in Idaho in North America both dated by Carbon 14 to 8000 B.C. The wheel, long thought to be an exclusive Sumerian invention of 3000 years B.C., was present in North Europe at more or less that time. To be sure even the idea of "biological evolution" arose independently in distant places and in "vicariant" forms, whether in the recent past or in ancient eras, Only in the mid-1800 did it establish a "centre of origin" – London – whence it spread via communication and transport the world over.

Who knows? might it not have been preferable, for its own critical development and its internal dialectics, if it had not supplanted so drastically other vicariant forms emerging here and there across our planet, for example the form that flourished in the garden of Turin's University, Italy.

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(Brendan White translator)