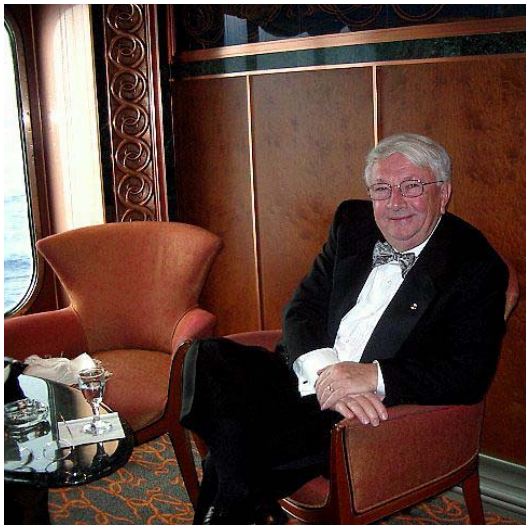
FROM SOPRON/UBC TO TWO NATIONAL ACADEMIES

Márta Mihály (BSF 1958, UBC) discusses László Orlóci's contributions to science.



László Orlóci 2004

Abstract. The field of science in which László contributed most significantly is best characterised by the title of an interdisciplinary symposium that he attended in 1990 at the University of Trieste: "Conceptual Tools for Understanding Nature". László is a forest ecologist and to him the Nature to be understood is shaped in convolutions of random and deterministic effects. The analytical isolation of these effects through scales is his *modus operandi*. László's seminal work in this field presented in books, journal articles, courses, colloquia, seminars, and scientific workshops earned him international recognition and honours from major universities, scientific institutions and learned societies. He feels most highly recognised by having been elected to the Hungarian Academy of Sciences as an academician member and to the Canadian Academy of Sciences of the Royal Society as a Fellow.

Contact: lorloci@uwo.ca

Links to relevant downloadable files:
http://vegetationdynamics.blogspot.com/
http://ecoqua.ecologia.ufrgs.br/~lorloci/Koa/
http://ecoqua.ecologia.ufrgs.br/~lorloci/Peony/

A.

I am glad to be present at this anniversary re-union and meet my old classmates. I am standing in for László. He is fulfilling long-standing commitments for research and high-level graduate training in the Departamento de Ecologia, Universidade Federal do Rio Grande do Sul Porto Alegre. His activities are under grant support from the Inter American Institute for Global Change Research (IAI) and the Brazilian granting agency CNPg.

B.

I would like to begin with a brief account of László's scientific career and then read you concisely phrased paragraphs that he feels reflect on the way he thinks and the things that interested him over the past 50 years. Incidentally this year marks our 50th Wedding Anniversary — and 50 long years of my considerable involvement in László's life with science.

C.

Since we became separated from the core Sopron Group, geography and the much diverged professional interests have not been helpful to keep closely in touch. But tears of separation notwithstanding, we both are proud to have come from that intellectual powerhouse that started in Sopron and received degrees at UBC. I have one (BSF) and László has three (BSF, MSc, PhD).

D.

There are many from our student years to whom we owe much and whom we remember with fondness and deeply felt admiration, including: Ferenc Tuskó and Sándor Jablánczy who taught us the traditional values in ethical forestry; Albert Stasney, Ignác Kiss and László Adamovitch for example-setting precision, completeness, and total commend at the lectern; Vladimir Krajina, Tommy Taylor, Wilfred Schofield from UBC and Peter Greig-Smith from the University College of North Wales for uncompromising yet always fair and patient guidance of László during his graduate and postdoctoral years.

E.

With postdoctoral training in the UK behind us, we settled down in London, Ontario in 1965 where László had appointment as Assistant Professor at University of Western Ontario (UWO) and I had the opportunity for part time teaching. László had rapid promotion through the ranks to Full Professor within a mere seven years. This helped him to become master in his own domain and pursue lines of interest that he chose for himself.

F.

He chose a mix of intramural and international teaching and research, but never administration. In these, he enjoyed generous support from the National Research Council, later National Science and Engineering Research Council, uninterrupted for 40 years, and from different

academic and scientific institutions who welcomed him as visiting professor and visiting scientist over the past 50 years.

G.

László contributed significantly to the development of conceptual tools and applications in statistical ecology. His early seminal paper on the ordination of variable-rich ecological data is a 1982 ISI Citation Classic. He pioneered an information theoretical approach in ecological data analysis; clarified the fundamentals of a species-free hierarchical approach in global community studies and developed techniques for the estimation of transition probabilities in temporal vegetation data. He provided a solution for the estimation of local thermal flux rates, under different scenarios of climate warming and elaborated the basic principles of process sampling stressing sample structure stability as optimality criterion. His ongoing research interest is concentrated on the approaches and conceptual tools of evolutionary community studies where process determinism, attractor migration, phase structure, periodicity, shape complexity, and parallelism are central notions.

H.

László's seminal work — presented in books, journal articles, courses, colloquia, seminars, and at workshops — earned him international recognition, and honours from major universities, scientific institutions and learned societies. He is recipient of a Doctor of Science degree *honoris causa* from the Universitá di Trieste in Italy; INTECOL's

(International Society for Ecology) Distinguished Statistical Ecologist award of the VI International Congress of Ecology at the University of Manchester in the U.K.; and a Twentieth Century Distinguished Service Award in Environmental and Ecological Statistics of the 9th Lukacs Symposium at Bowling Green State University, in Ohio. He is an Invited Visiting Professor and Visiting Scientist at universities and research centres in Argentina, Brazil, Hawaii, New Mexico, China, Ethiopia, Tanzania, Hungary, Spain, Italy, and Switzerland.

If asked, he would say he feels most highly recognised by having been elected into the Hungarian Academy of Science as an Academician member, and into the Academy of Sciences of the Royal Society of Canada as a Fellow.

I.

László is a forest ecologist and to him the Nature to be understood is dynamically drawn toward an attractor, it is irregularly cyclic, and has scale and shape, and in these it has the imprints of random and deterministic effects. He believes that the analytical isolation of the various effects is a key step toward Nature's understanding. He brings relevant ideas and evidence under one roof in the monograph *"Trajectory Analysis: Probing for regularities in vegetation dynamics".*

J.

His *trajectory* has technical definition as the analytical mapping of temporal transitions in vegetation composition and functionality within

phase space. Considering that the axes of László's phase space represent community elements (taxa, functional types, or else), the trajectory itself is the *time dimension*. Considering further that the trajectory's characteristics are symptomatic of vegetation response to extrinsic and intrinsic factor influences, he believes the trajectory should be a focal point of dynamic studies, intended to identify the causal factors and the governing principles of the process. László placed a copy of the advanced draft of his monograph on trajectory analysis on the Host's website.

K.

As last item, and mainly to amuse class mates with whom we have taken projective geometry, taught by Alfréd Stasney — our noted and often feared professor of the subject — I like you to show a graph from an early publications of László. In this, he provides solution to a rotation problem to oblique axes (X,Y in the figure) in the Bray-Curtis ordination.

Please address all questions directly to László. His e-mail address is lorloci@uwo.ca

Orlóci, L.. 1974. Revisions for the Bray and Curtis ordination. Can. J. Bot. 52:1773-1776.

common plane M. This plane is so selected that it incorporates Y and it is parallel to X. Further-

1. Draw triangles ABC and ABD (Fig. 1).
2. Draw line M' through point D parallel to

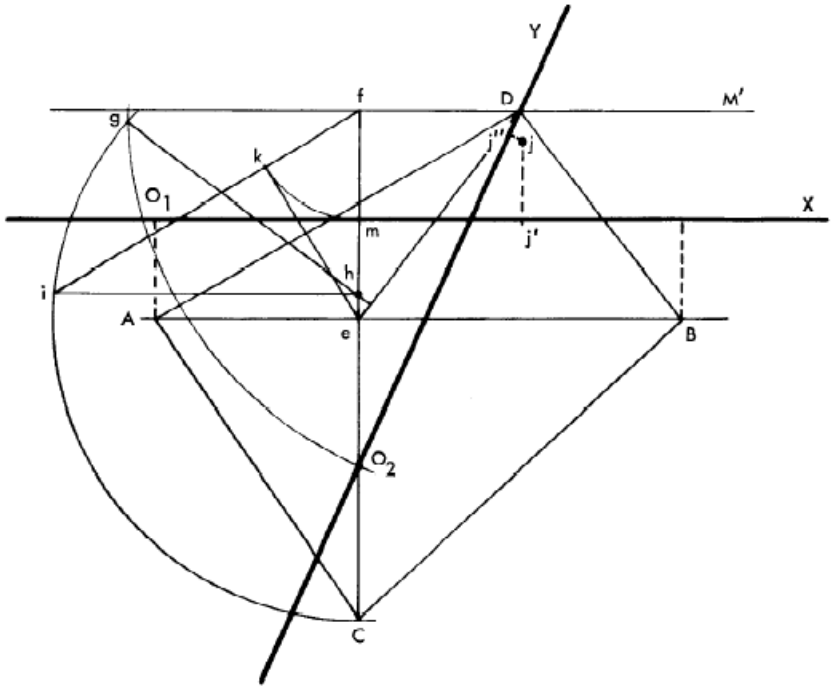


FIG. 1. Graphical solution for oblique axes (X, Y) in a modified Bray and Curtis ordination. See description of method in the main text.

TABLE 2

Sample distances for ordination poles $ABCD$, and stand j. A, B are poles for axis X, and C, D for axis Y

$c(A, A)$	$c(A, B)$	$c(A, C)$	$c(A, D)$	$c(A, j)$	0	1.20	0.84	0.96	0.93
$c(B, B)$	$c(B, C)$	$c(B, D)$	$c(B, j)$		0	1.02	0.63	0.54

Selected publications from L. Orlóci

Copies of publications directly relevant to this presentation are listed below. Many of these may be downloaded free of charge from L. Orlóci's Ecoqua webpage:
http://ecoqua.ecologia.ufrgs.br/~lorloci/Koa/

or obtained from:
The Reprint Collection of Statistical Ecology
Departamento de Ecologia
Universidade Federal do Rio Grande do Sul
Porto Alegre, RS, 91540-000, BRASIL

Orlóci, L. 1966. Geometric models in ecology. I. The theory and application of some ordination methods. J. Ecol. 54:193-215. –a 1986 ISI Citation Classic.

Orlóci, L. 1967. Data centering: a review and evaluation with reference to component analysis. Syst. Zool. 16:208-212.

Orlóci, L. 1969. Information analysis of structure in biological collections. Nature 223:483-484.

Orlóci, L. 1971. An information theory model for pattern analysis. J. Ecol. 59:343-349.

Orlóci, L. 1974. On information flow in ordination. Vegetatio 29:11-16.

Orlóci, L. 1976. Ranking species by an information criterion. J. Ecol. 64:411-419.

Orlóci, L. 1978. Multivariate Analysis in Vegetation research. 2nd ed. W. Junk, The Hague.

Orlóci, L. and W. Stanek. 1980. Vegetation survey of the Alaska Highway, Yukon Territory: types and gradients. Vegetatio 41:1-56.

Orlóci, L. and M. Orlóci. 1985. Comparison of communities without the use of species: model and example. Ann. Bot. (Roma) 43:275-285.

Orlóci, L. and M. Orlóci. 1988. On recovery, Markov chains and canonical analysis. Ecology 69:1260-1265

Orlóci, L. and V. de Patta Pillar. 1989. On sample size optimality in ecosystem survey. Biométrie-Praximétrie. 29:173-184

Orlóci, L. and M. Orlóci. 1990. Edge detection in vegetation: Jornada revisited. Journal of Vegetation Science 1:311-324.

Orlóci, L. 1991. On character-based community analysis: choice, arrangement, comparison. *In:* Feoli, E. and L. Orlóci (eds.) Computer Assisted Vegetation Analysis, pp. 81-93. Kluwer Academic Publishers, London.

Orlóci, L. 1991. CONAPACK: A program for Canonical Analysis of Classification Tables. Ecological Computations Series: Vol. 4. SPB Academic Publishing, The Hague. -- detailed account of techniques, examples of application and a computer program.

Orlóci, L. 1991. Entropy and Information. Ecological Computations Series: Vol. 3. SPB Academic Publishing, The Hague. -- detailed account of techniques, examples of application and a computer program.

Orlóci, L. 1993. The complexities and scenarios in ecosystem analysis. *In*: G. Costa, G. Calluci and M. Giorgi (eds.) Conceptual Tools for Understanding Nature, pp. 168-176. World Scientific, London.

Orlóci, L., M. Anand and X. S. He. 1993. Markov chain: a realistic model for temporal coenosere? Biométrie-Praximétrie 33:7-26.

Orlóci, L. 1994. Global warming: the process and its anticipated phytoclimatic effects in temperate and cold zone. Coenoses 9: 69-74.

Orlóci, L. 2001. Pattern dynamics: an essay concerning principles, techniques, and applications. Community Ecology 2:1-15.

Orlóci, L. 2001. Prospects and expectations: reflections on a science in change. Community Ecology 2: 187-196.

Orlóci, L., V.D. Pillar, M. Anand and H. Behling. 2002. Some interesting characteristics of the vegetation process. Community Ecology 3:125-146.

Orlóci, L., M. Anand, and V. D. Pillar. 2002. Biodiversity analysis: issues, concepts, techniques. Community Ecology. Community Ecology 3: 217-236.

Orlóci, L. 2006. Diversity partitions in 3-way sorting: functions, Venn diagram mappings, typical additive series, and examples. Community Ecology 7:253-259.

Orlóci, L., V.D. Pillar, and M. Anand. 2006. Multiscale analysis of palynological records: new possibilities. Community Ecology 7:53-68.

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Poore, M.E.D. 1962. The method of successive approximation in descriptive ecology. In: Advances in Ecological Research. Vol. 1, pp. 35-68. Academic Press,