JAARVERSLAG 1995, Sectie Theoretische Biologie

A. Inleidende tekst:

The Section designs unifying frameworks as well as mathematical tools, for studying evolutionary and ecological problems, both on an a priori basis and in close cooperation with experimental groups. The research ranges from exploring the consequences of established biological theories to the construction of models for specific biological systems, the latter often with a view to develop data-analytical techniques. In addition the section investigates the nature of key biological concepts, both with a narrow biological focus, and seen against the context of their societal embedding.

B. Voortgang projecten:

Project 1.94.1. Mathematical foundations of individual - based population models.

Heads: Prof.dr. O. Diekmann, Prof.dr. J.A.J. Metz.

Description: The design and examination of mathematical formalisms for stepping from the physiological/behavioural levels to the description of changes in population densities.

Progress: As a first analytical inroad in the many simulation studies of epidemics on graphs, an equation has been derived for the initial threshold value and for the final fraction infected, in an epidemic in a large population where everybody is linked to a fixed finite number of acquaintances, whom he can infect or can be infected by, where the circles of acquaintances of directly linked individuals are independent but for the connecting link.

Project 1.94.2. Population dynamics.

Heads: Prof.dr. O. Diekmann, Prof.dr. J.A.J. Metz.

Description: Investigation and classification of the types of dynamical behaviour of populations in dependence on the underlying mechanisms.

Progress: An efficient strategy has been developed for approximately simulating the dynamics of a metapopulation in which the local populations have an explicit, not completely stylised, population dynamics, including both demographic stochasticity and the occasional occurrence of local catastrophes.

Project 1.94.3. Adaptive dynamics.

Heads: Prof.dr. O. Diekmann, Prof.dr. J.A.J. Metz

Description: The investigation of the process of trait substitutions resulting from the selective filtering of mutational variation, with particular reference to the characterization and classification of singular points such as branching points and Evolutionary Stable Strategies.

Progress: A graph theoretical approach has been found for analyzing the axiom systems which relate properties of the invasion rates of a mutant as a function of the mutant and resident trait values and the spaces of the various protected trait combinations. Necessary and sufficient conditions on the population dynamics under which an ESS argument leads to an equivalent optimisation principle have been derived, as well as necessary and sufficient conditions under which such a principle can be reduced to either r- or R0-optimisation (two

customarily used, but in retrospect badly founded, principles). Focusing on potentially symbiotic interactions between two species it has been shown – both by individual-based simulations and by investigation of adaptive random walks in appropriate trait spaces -- that a merger of evolutionary lineages in principle can arise from a host of different ecological starting conditions. This result provides a first step in the analysis of the coevolutionary emergence of holobionts.

Project 1.94.4. Phylogeny - reconstruction and analysis of historically associated lineages.

Head: Dr. M.Zandee.

Description: Development of theory, methods and data-analysis in systematical biology, based on the cladistic method.

Progress: It has been found that Goloboff's `fitness measure' for phylogenetic trees depends in an inconsistent manner on the constant determining the relation between the number of additional steps in the tree due to a character, and the weight given to that character.

Project 1.94.5. Study of the separate effects of evolutionary optimisation and phylogenetic constraints on the variation in behaviour within groups of related species.

Heads: Dr. P. Haccou, Dr. M.R. Zandee.

Description: Development of optimality models of behaviour in general, specifically applied to parasitoids of the genus Leptopilina. Study of the relationship between phylogeny and behavioural strategies.

Progress: A procedure by which the phylogenetic aspects of certain types of morphometric measures can be unravelled has been devised, and applied to a data set pertaining to Haplochromine cychlids from Lake Victoria. It has been proved that optimal mixed strategies in stochastically fluctuating environments are robust against small perturbations in both the form of the pay - off function and the probability distribution of the fluctuations. It has been proved that in stochastically fluctuating environments, an increase in the importance of parental relative to juvenile survival leads to a shift of the optimal clutch size from one maximising the geometric to one maximising the arithmetic mean of the yearly reproduction.

Project 1.94.6. Analysis of speciation through partial reproductive isolation

Head: Dr. F.H.D. van Batenburg.

Description: Analysis of the influence of partial reproductive isolation upon speciation using simulation models.

Progress: We have not worked on this problem during 1995.

Project 1.94.7. Development of methods for predicting the secondary structure of RNA

Head: Dr. F.H.D. van Batenburg.

Description: Development of theory, methods and computer programs for the deduction of the secondary structure of RNA from data on the primary structure.

Progress: After the greedy algorithm and the stochastic algorithm the focus has been changed to a home-bred genetic type of algorithm. This newest algorithm has been fine-tuned by

making the simulated folding path more in accordance with the natural path. This enabled the explanation of processes -- often determined by intermediate metastable, functional, states -- that are impossible to explain by the standard minimum energy algorithms. Examples are an RNA that is only functional for a short time, and an RNA that either does or does not synthesize a suicide enzyme, depending on the folding pathway.

Project 1.94.8. Analysis of the effects of human activities on the development of ecological systems

Head: Drs. E. Meelis.

Description: Development of methods for the analysis of environmental monitoring data.

Progress: A generalization of the sequential likelihood ratio test has been derived for the case of more complicated composite hypotheses. When analyzing biological monitoring data the overall performance of the test appeared to be improved considerably by an adjustment, based on provisional parameter estimates, of the critical values.

Project 1.94.9. Relation between reductionist and non - reductionist approaches within biology

Head: Dr. Th.E. Sprey.

Description: Research into the importance of šstructuralist and phenomenological approaches for biology, and for the role of biology within society, for instance in relation to the discussion about basic attitudes and the environmental crisis.

Progress: In order to understand the phenomenon (plant, animal) in its relation with the environment, observations were made on birds and specimens of the Ranunculaceae.

Project 1.94.10. Biological science and the relation between man and nature/animals.

Head: Dr. H. Verhoog.

Description: Analysis of the human (biologist's) attitude and relation towards nature, and the implications of biological thinking for our concept of man.

Progress: A workshop on `The Philosophy of Biological Form' was organized for the ISHPSSB conference (Leuven, Belgium). This offered a further basis for cooperation with Brian Goodwin on the increasingly important topic of structuralism. The project is strengthened by the succesful grant application for a part-time senior researcher (Priority programme Ethics and Policy, NWO). Dr. M.B.H. Visser was appointed on 1 September 1995 and will work for 15 months on the (sub)project `Moral relevance of the concept of naturalness'.

Project 1.94.11. Development of the concept of composite species.

Head: Prof.dr. D.J. Kornet.

Description: Formal reconstruction of the species concept, especially the determination of species boundaries in the time dimension.

Progress: Splits in the genealogical network from which (composite) species arise appear not necessarily to coincide with splits corresponding to the branching points of phylogenetic

trees. The supposition that they do caused vast confusion in the literature. The project will be strengthened by two grants. A post-doc will work for a year (starting 1 January 1996) on the subproject `The concept of specific behaviour' (NWO, priority programme Ethics and Policy). A research assistent (OIO) will work for four years (starting 1 November 1995) on the subproject `Methods for biogeographic analysis: comparison and evaluation' (NWO, SLW programme `Foundations of Phylogenetic Systematics').

C. Personeel

STAFF

	Senior investigators	: function	source of finance
BQ1	Prof.dr. O. Diekmann:	full professor	Leiden University0,4 to 1/9
BQ1	Prof.dr. J.A.J. Metz:	full professor	Leiden University
BQ3	Prof.dr. D.J. Kornet:	LUF professor	LUF
BQ2	Dr. F.H.D. van Batenburg:	assistant professor	Leiden University
BQ2	Dr. P. Haccou :	assistant professor	Leiden University
BQ2	Drs. E. Meelis:	assistant professor	Leiden University
BQ3	Dr. Th.E. Sprey:	assistant professor	Leiden University
BQ3	Dr. H. Verhoog:	assistant professor	Leiden University
BQ2	Dr. M. Zandee:	assistant professor	Leiden University

Postdocs

BQ1	Dr. J. Val:	researcher	0.5
BQ1	U. Dieckmann:	researcher	from 1/4
BQ2/3	Dr. H. Turner:	researcher	from 1/10

Senior investigators

BQ3	Dr. M.B.H. Visser:	researcher	0.2, from 1/9

Junior investigators

BQ3	Drs. M.J.P. Maas:	research assistant	0.8
BQ1	Drs. F.S.A. Jacobs:	research assistant	Leiden University
BQ2	Ir. J. v. Velzen:	research assistant	Leiden University
BQ2	Drs. M. Schipper :	research assistant	Leiden University
BQ1	Drs. S.D. Mylius:	research assistant	Foundation for Life Sciences 0.8
BQ1	Drs. G. Mulder:	research assistant	Leiden University0.8
BQ2/3	Drs. J. Hogendoorn:	research assistant	SLW from 1/11

Analytical, technical and administrative staff

H. Regeer	Groenhuijzen:	secretary	Leiden University

Y.M. Zitman	de Graaf:	secretary	Leiden University

Guests

BQ1	Drs. W.M.A. Bressers:	researcher	volunteer to 1/9
BQ3	Prof.dr. P. Dullemeijer:	researcher	volunteer 0.1
BQ2	Dr. S. Gultyaev:	researcher	NWO/EMBO
BQ1/2	Drs. J. Verboom:	researcher	IBN 0.2
BQ1/2	Dr. N. v.d. Hoeven:	researcher	volunteer 0.2
BQ3	Dr. M.B.H. Visser:	researcher	volunteer 0.2, to 1/9

D. Samenwerking: COOPERATION (projectcodes are indicated between brackets)

Leiden

- RHHB, RUL, Prof.dr. C.G. Kalkman (1.94.11)
- RHHB, RUL, Dr. P.C. van Welzen (1.94.4)
- vg. Biochemie RUL, Dr. C. Pley (1.94.7)
- Medische Fac. RUL, Prof.dr. Tj. de Cock Buning (1.94.10)
- Fac. Wijsbegeerte RUL, Dr. J.W. McAllister (1.94.11)

National

- Amsterdam, CWI, Drs. Th. Hantke (1.94.2)
- Amsterdam, CWI, Drs. A. de Koeyer (1.94.2)
- Amsterdam, CWI, Dr. Yu.A. Kuznetsov (1.94.2)
- Amsterdam, vg. Zuivere en Toegepaste Oecologie UvA, Dr. A.M. de Roos (1.94.1/2)
- Amsterdam, vg. Zuivere en Toegepaste Oecologie UvA, Prof.dr. M.W. Sabelis (1.94.2/3)
- Amsterdam, UvA, Dr. S.M. Verduijn Lunel (1.94.1)
- Amsterdam, vg. Theoretische Biologie VUA, S. Kasanmoentalib (1.94.10)
- Bakkeveen, Volkshogeschool Allardsoog, G. WÀG?Àring (1.94.9)
- Bilthoven, RIVM, Dr. E.J.M. Veling (1.94.2)
- Bilthoven, RIVM, Dr. M. Kretzschmar (1.94.2)
- Driebergen, Vrije Hogeschool, B. Siepman v.d. Berg (1.94.9)
- Driebergen, L. Bolk Instituut, I. E. Lammerts (1.94.10)
- Eindhoven, Reuter (ASWI standaards), Drs. L. van Geldrop (a)
- Enschede, TU Twente, Dr. S.A. van Gils (1.94.2)
- Enschede, TU Twente, ASWI, Ir. F. Bonnema (a)
- Groningen, Vg. Genetica, Univ. of Groningen, Dr. F. Weissing (1.94.3)
- Leersum, IBN DLO, Dr. P. Opdam (1.94.2)
- Lelystad, CDI - DLO, Dr. M.C.M. de Jong (1.94.1/2)

- Lexmond, Adfee (ASWI standaards), B. Smoor (a)
- Leusden, ILEIA, ETC - Foundation, Dr. M. Kooistra (1.94.9)
- Texel, IBN - DLO, Dr. P.J.H. Reijnders (1.94.2)
- Wageningen, Ecologische Landbouw LUW, Drs. W. Beekman (1.94.9)
- Wageningen, Ecologische Landbouw LUW, Dr. Ir. R. Boersma (1.94.9)
- Wageningen, Sociologie LUW, Prof.Dr. I. Weeda (1.94.9)
- Wageningen, vg. Wiskunde LUW, Dr. F. v.d. Bosch (1.94.2)
- Wageningen, Dienst Landbouw, wiskunde - DLO, Dr. J.A.P. Heesterbeek (1.94.2)

International

- Albany, New York, USA, Dept. Humanities, Prof.dr. W. Wittkowski (1.94.9)
- Antwerpen, Belgium, UIA, Drs. T. van Dooren (1.92.3)
- Ascot, UK, Imperial Coll./NERC Centre for Pop. Biol., Dr. H.C.J. Godfray (1.94.3)
- Ascot, UK, Imperial Coll./NERC Centre for Pop. Biol., H. Wilson (1.94.3)
- Belmont, MA, USA, World Inst. Phenomenological Research, Prof.dr. A.T.T. Tymieniecka (1.94.9)
- Bristol, UK, Dept. Mathematics Univ. of Bristol, Dr. J. McNamara (1.94.5)
- Budapest, Hungary, Eo?Àtvo?Às University, Dr. À(?À. Kisdi (1.94.3/5)
- Budapest, Hungary, Eo?Àtvo?Às University, Drs. G. Meszena (1.94.3)
- Budapest, Hungary, Eo?Àtvo?Às University, Dr. L. Pasztor (1.94.3)
- Budapest, Hungary, Eo?Àtvo?Às University, and Collegium Budapest, Prof.dr. E. Szathmary (1.94.3)
- Cambridge, UK, University of Cambridge, Dr. P. Marrow (1.94.3)
- Diepenbeek, Belgium, Limburgs Universitair Centrum, Drs. E. Nuyts (1.94.3)
- Fukuoka, Japan, Kyushu Univ., Prof.dr. Y. Iwasa (1.94.5)
- Glasgow, UK, Univ. of Strathclyde, Dr. D. Greenhalgh (1.94.2)
- Hanoi, Vietnam, Univ. of Hanoi, Dr. Nguien Ba (1.94.9)
- JÀG?Àlich, Germany, Forschungszentrum JÀG?Àlich, Drs. U. Dieckmann (1.94.3)
- Leipzig, Germany, Umweltforschungszentrum Leipzig, Prof.dr. C. Wissel (1.94.2)
- Milton Keynes, UK, Open Univ., Prof.dr. B.C. Goodwin (1.94.10)
- Paris, France, Laboratoire d'Ecologie, Ecole Normale Superieure, Dr. R. FerriÀ/?Àre (1.94.3)
- Paris, France, À(?Àquipe de Logique MathÀ)?Àmatique, Univ. Paris VII, Dr. H.A.J.M. Schellinx (1.94.11)
- Prag, Czech Republic, University of Prag, Dr. T. Herben (1.94.2)
- Rochester, New York, USA, Dept. Psychology, Dr. L. Sundararajan (1.94.9)
- Santa Barbara, USA, Univ. of California, Prof.dr. R.M. Nisbet (1.94.1)

- Sheffield, UK, School of Probability, Univ. of Sheffield, Prof.dr. C. Cannings (1.94.3)
- Stanford, USA, Stanford University, Prof.dr. S. Tuljapurkar (1.94.5)
- Tempe, USA, Arizona State Univ., Dr. H.R. Thieme (1.94.1)
- Tijuana, Mexico, Esc. de Munanidades, Prof.Dr. H. Matthai Quelle (1.94.9)
- Toronto, Canada, Dept. Zoology Univ. Toronto, Prof.dr. D.R. Brooks (1.94.4)
- Trento, Italy, Dipartimento di Matematica, Univ. of Trento, Dr. A. Pugliese (1.94.3)
- Turku, Finland, Math. Inst. Univ. of Turku, Prof.dr. M. Gyllenberg (1.94.1)
- Vancouver, Canada, Simon Fraser University, Prof.dr. B. Roitberg (1.94.5)
- Warwick, UK, Mathematics Department, Univ. of Warwick, Prof.dr. D. Rand (1.94.3)
- Wenen, Austria, Institut fÀG?Àr Mathematik, K. Sigmund (1.94.3)
- York, UK, University of York, Dr. R. Law (1.94.3)
- ZÀG?Àrich, Switzerland, Dept. Umweltnaturwissensch., Prof.Dr. T. Abt (1.94.9)

E. Publicaties:

"Publications in scientific journals":

FHD van Batenburg Powerful and easy graphics: a cry for help. APL Quote Quad 25: 49 - 56.

FHD van Batenburg Powerful and easy graphics: a cry for help. APL - CAM Journal 17:1-69.

FHD van Batenburg, AP Gultyaev, CWA Pleij An APL - programmed genetic algorithm for the prediction of RNA secondary structure. J. theor. Biol. 174: 269 - 280.

FHD van Batenburg, A Smith Report on workshop on portability. Vector 12: 56 - 59.

FHD van Batenburg Font for the future. Vector 12: 64 - 69.

WMA Bressers, MR Kruk, AMM van Erp, DC Willekens - Bramer, P Haccou, E Meelis Time structure of self - grooming in the rat: self - facilitation and effects of hypothalamic stimulation and neuropeptides. Behavioral Neurosciences 109: 955 - 964.

WMA Bressers, MR Kruk, AMM van Erp, DC Willekens - Bramer, P Haccou, E Meelis A time - structured analysis of hypothalamically induced increases in self - grooming and ctivity in the rat. Behavioural Neurosciences 109: 1158 - 1171.

CJ Briggs, RM Nisbet, WW Murdoch, TR Collier, JAJ Metz Dynamical effects of host^{a}feeding in parasitoids. Journal of Animal Ecology 64: 403 - 416.

Tj de Cock Buning, R Heeger, H Verhoog Ethische Argumente bei der Beurteilung von Tierversuchen. Altex 12: 2 - 12.

O Diekmann, MCM de Jong, AA de Koeijer, P Reijnders The force of infection in populations of varying size: a modelling problem. J. Biol. Syst. 3: 519 - 529.

O Diekmann, M Gyllenberg, HR Thieme Perturbing evolutionary systems by step responses and cumulative outputs. Differential and Integral Equations 8: 1205 - 1244.

SAH Geritz Evolutionarily stable seed polymorphism and small - scale spatial variation in seedling density. The American Naturalist 146: 685 - 707.

AP Gultyaev, FHD Van Batenburg, CWA Pleij The computer simulation of RNA folding pathways using a genetic algorithm. J. Mol. Biol. 250: 37 - 51.

AP Gultyaev, FHD Van Batenburg, CWA Pleij The influence of a metastable structure in plasmid primer RNA on antisense RNA binding kinetics. Nucleic Acids Research 23 No 18: 3718 - 3725.

P Haccou, Y Iwasa Optimal mixed strategies in stochastic environments. Theoretical Population Biology 47: 212 - 243.

HH de Iongh, BJ Wenno, E Meelis Seagrass distribution and seasonal biomass changes in relation to dugong grazing in the Moluccas, East Indonesia. Aquatic Botany 50 1 - 19.

VAA Jansen Effects of dispersal in a tri - tropic metapopulation model. Journal of Mathematical Biology 195 - 224.

VAA Jansen, MW Sabelis Outbreaks of colony - forming pests in tri - trophic systems: consequences for pest control and the evolution of pesticide resistance. Oikos 74: 172 - 176.

VAA Jansen, Regulation of predator - prey systems through spatial interactions: a possible solution to the paradox of enrichment. Oikos 74: 384 - 390.

DJ Kornet, JAJ Metz, HAJM Schellinx Internodons as equivalence classes in genealogical networks: building - blocks for a rigorous concept. J. Math. Biol. 34: 110 - 122.

SD Mylius, O Diekmann On evolutionarily stable life histories, optimization and the need to be specific about density dependence. Oikos 74: 218 - 224.

"Books and book chapters":

O Diekmann, SA van Gils, SM Verduyn Lunel, H - O Walter Delay equations: functional - ,complex - and nonlinear analysis. Applied Mathematical Sciences Volume 110, New York, Springer.

O Diekmann, JAJ Metz, H Heesterbeek The legacy of Kermack and McKendrick In: D. Mollison, ed., Epidemic Models: Their Structure and Relation to Data. p. 95 - 115. Cambridge Univ. Press.

M Jong, O Diekmann, H Heesterbeek How does transmission of infection depend on population size? In: D. Mollison, ed., Epidemic Models: Their Structure and Relation to Data. p. 84 - 94. Cambridge Univ. Press.

DJ Kornet De liefde voor de wetenschap. 28p. Inaugurale rede 27 oktober 1995 RUL.

JAJ Metz, F van den Bosch Velocities of epidemic spread In: D. Mollison, ed., Epidemic Models: Their Structure and Relation to Data. p. 150 - 186. Cambridge Univ. Press.

H Verhoog Gentechnik und die EigenwÀG?Àrde der Natur. Mein Weg zur ethische Urteilsbildung. Elemente der Naturwissenschaft 63: 1 - 13.

"Other publications:"

FHD van Batenburg APL in the Biology Department of Hanoi University. APL Quote Quad 25: 7.

FHD van Batenburg, A Smith Portability issues. Conference Proceedings APL95 4pp.

BM Bolker et al. (including J.A.J.Metz). Group report: Spatial dynamics of infectious diseases in natural populations. In: B.T. Grenfell & A.P. Dobson, ed., Ecology of Infectious Diseases in Natural Populations, p.399 - 420. Cambridge University Press.

O Diekmann The many facets of evolutionary dynamics. Amsterdam, CWI, Report AM^{a}R9520 1995: 12p.

O Diekmann, MCM de Jong, JAJ Metz A deterministic epidemic model taking account of repeated contacts between the same individuals. Amsterdam, CWI, Report AM - R9517 995:

1 - 14.

O Diekmann, AA de Koeijer, JAJ Metz On the final size of epidemics within herds. Amsterdam, CWI Report AM - R9502 8p.

AP Gultyaev, FHD Van Batenburg, CWA Pleij The simulation of stable and metastable RNA foldings using a genetic algorithm. ECAL'95. 3rd. European Conference on Artificial Life, Granada, Spain, June 4 - 6, 1995, p. 69.

A de Koeijer, O Diekmann, P Reijnders A mechanistic model to describe the spread of phocid distemper virus. CWI Report AM - R9514 11p.

JAJ Metz, SAH Geritz, G MeszÀ)?Àna, FJA Jacobs, JS van Heerwaarden Adaptive Dynamics: A geometrical study of the consequences of nearly faithful reproduction. Laxenburg, Oostenrijk, IIASA, Working Paper, 33p + 15 figs.

AF Read et al. (including J.A.J.Metz). Group report: Genetics and evolution of infectious diseases in natural populations. In: B.T. Grenfell & A.P. Dobson, ed., Ecology of Infectious Diseases in Natural Populations, p.450 - 477. Cambridge University Press.

H Verhoog The oppressed tradition of caring objectivity in western culture. In: Agriculture and spirituality, 43 - 49. Essays from the Crossroads Conference of Wageningen Agricultural University. Utrecht, International Books.

H Verhoog Ethiek en het maken van transgene proefdieren. Biotechniek (1995) 34: 13 - 17.

H Verhoog Dissonanten en het publieke debat over biotechnologie. BioNieuws (1995) 5/7:2.

H Verhoog Het menselijk embryo tussen biologisch en persoonlijk leven. Filosofie & Praktijk (1995) 16: 96 - 106.

H Verhoog Ethiek en de kwetsbaarheid van dieren. In: het kwetsbare dier in de intensieve veehouderij. Rapport Studiecommissie Intensieve Veehouderij, Den Haag. (1995) 16 - 21.

H Verhoog Woede en verdriet over Herman. Geno (1995) 2: 2.

H Verhoog Genetische manipulatie van dieren: ja, mits of nee, tenzij? Tegenbericht (1995) 65: 3 - 4.

F. Dissertaties:

G. Invited lectures:

AP Gultyaev Genetic algorithms for RNA structure prediction. Condensed Matter and Materials Physics Conference, University of Liverpool UK, December 19 - 21

P Haccou Analysis of behaviour based on time - structured models. Hongaarse vereniging van ethologen, Budapest Hungary, January 27

JAJ Metz The potential for evolution towards stability in simple population dynamics. Workshop Current Issues and Controversies in Biological Dynamics. I. Newton Institute, Cambridge UK, November 30

JAJ Metz Adaptive dynamics: a geometrical study of the consequences of nearly faithful reproduction. IIASA, Laxenburg Austria, October 12

JAJ Metz Adaptive dynamics and evolutionarily singular strategies: geometrical consequences of nearly faithful reproduction. 5th Congress of European Society for Evolutionary Biology, Edinburgh Scotland, September 6

JAJ Metz Het evolutie - idee in de biology. Symp. Van Quark tot Mens, TU Delft the

Netherlands April 27

JAJ Metz Adaptive dynamics: a geometrical study of the consequences of nearly faithful reproduction. KNAW Colloquium Dynamical Systems and Theory Applications in Science, January 26

ThE Spreij Parallels between generative principles in biological and psychological development. 2nd World Phenomenology Congress, Guadalajara Mexico, September

H Verhoog Adolf Portmann and the philosophy of biological form. Congress Internat. Soc. for the History, Philosophy and Social Studies of Biology, Leuven Belgium, July 21

H Verhoog Ethics and genetic engineering. Conf. Internat. Forum for Genetic Engineering, London UK, December 2

M Zandee Component compatibility in analyzing historically - associated lineages. Symposium Phylogenetics of historically - associated lineages: parasites and hosts, taxa and areas, genes and , Annual meeting of the SSB, SSE and ASN, Montreal Canada, July 8 - 12

FHD van Batenburg

- Board Dutch APL Association

- APL Study group International Standards Organisation

O Diekmann

- National coordinator EC twining project 'evolutionary systems'

- European Society for Mathematical and Theoretical Biology, board

- Akademie Raad voor de Wiskunde

- Chair NWO Priority programm 'Non - Linear Systems'

- Honorary member and adviser centre of non - linear systems in biology, University of Dundee

- Editor Journal of Mathematical Biology

- Associate editor Japan Journal of Applied Mathematics

- Associate editor Canadian Applied Mathematics Quarterly

- Associate editor Mathematical Models and Methods in Applied Sciences

P Haccou

- Chair team SLW Study group Population Biology

- Associate editor Behavioural Processes

- Associate editor American Naturalist

E Meelis

- Chair team SLW Study group Ethology

- Secretary Study group Milieubeheer Leiden

JAJ Metz

- Consultant Dept. AM, CWI, Amsterdam

- Judgement committee D, SLW

- Committee Non - linear Population dynamics

- Advisory committee Theoretical Biology RUG

- Curator LUF endowed chair Philosophy of Biology

- Editor Acta Biotheoretica

- Organising Committee ICSEB V

ThE Sprey

- ÂProject coordinator `education', cooperation VH3 between Vietnam, University of Hanoi and some Dutch Universities

H Verhoog

- NIBI Committee Profession codes

- Subcommittee Ethics and societal aspects, committee Genetical Modification (VROM)

- Provisional committee Ethical testing genetical modifi¬cation of animals (LNV)

- Study group intensive cattle farming (animal protection society¬)

MBH Visser

- Dutch Association for Bio - ethics

- Steering committee Biotechnology IMPULS: Technology Museum NINT, Amsterdam

- External advisory committee Education Animal Management, Van Hall Institute

- Committee 'Re - use', Primate Research Centre TNO

I. Wetenschappelijke prijzen:

Drs. S.A.H. Geritz received the Kuenenprijs.

J. 2e fase cursussen/summer - of winterschools:

Course `Infectious Disease Models, CWI, Amsterdam, J.A.J. Metz, 6 one day sessions. Special Year in Mathematical Biology, University of Utah, principal lecturer, fall quarter

1995, O. Diekmann

External examiner for 3 Ph.D theses abroad, O. Diekmann: E. Grist (Strathclyde, Glasgow,

UK), J. Saldana (Autonoma, Barcelona, Spain), M. Kirkilonis (Heidelberg, Germany)

K. Symposia/congressen:

Internat. Soc. for the History, Philosophy and Social Studies of Biology, deelnemers 300, session: The Philosophy of Biological Form, Leuven, Belgium, July 1923, Henk Verhoog (+ Brian Goodwin), 50 deelnemers

Internat. Conf. on Mathematical Modeling, Brunei, 1995, O. Diekmann, scientific commmittee

Fourth Internat. Conf. on Mathematical Population Dynamics, Houston, 1995, O. Diekmann, scientific commmittee

L. Bezoekende onderzoekers:

Dr. G. MeszÀ)?Àna, Eo?Àtvo?Às University, Budapest, Hungary, April 3 - June 7

Prof.dr. G. Wagner, Yale University, June 7 - 12

Sabine Brauckmann, UniversitÀ??Àt MÀG?Ànster, Germany, October 23 - 26

Prof.dr. W. Alt, Univ. of Bonn, Germany, October 2 - 5

Prof.dr. M. Gyllenberg, Univ. of Turku, Finland, October 2 - 5

Dr. L. Pasztor, Eo?Àtvo?Às University, Budapest, Hungary, October 13 - 20

Drs. Z. Toth, Eo?Àtvo?Às University, Budapest, Hungary October 13 - 20

Lukas Rist, ZÀG?Àrich, Switserland, October 30 - November 3

Drs. S.A.H. Geritz, Eo?Àtvo?Às University, Budapest, Hungary, November 17 - 18

Dr. À(?À. Kisdi, Eo?Àtvo?Às University, Budapest, Hungary, November

Dr. J. McNamara, Univ. Bristol, UK, November 23 - 29

Prof. P. Abrams, Dept. of Zoology, Univ. of Maryland, USA, December, 4 - 8

M. Gastsprekers:

June 8,9, Prof.dr. G. Wagner, Yale University, 4 lectures: What is biology?, The biological concept, Homology and developmental mechanisms, The biological role and the origin of homologues.

June 16, S. MareÀ)?À, Bioinformatica, RU Utrecht, Modelling in algae and Daphnia interactions.

June 16, Dr. B. Ens, IBN, Texel, The despotic distribution and deferred maturity in the Oystercatcher, two sides of the same coin.

June 16, Dr. M.C.M. de Jong, Veterinair Instituut, Lelystad, Infectious diseases dynamics in herds.

June 16, Prof.dr. M. Sabelis, Vg Populatiebiologie, Univ. v. Amsterdam, The milker killer dilemma of predatory mites in the interaction with phytophagous mites and their hosts.

October 4, Prof.dr. M. Gyllenberg, Univ. of Turku, Finland, Why do animals live in barren habitats? Analysis of a discrete meta - population model.

October 4, Prof.dr. S.A.L.M. Kooijman, VU, Amsterdam, Mass conservation in the energetics of structured populations.

October 4, Dr. F.H.D. van den Bosch & Dr. A. de Roos, LU, Wageningen & Univ. Amsterdam, Cannibalism as a life boat mechanism: Is the theory complete?

October 4, Dr. H. Heesterbeek, GLW - DLO, Wageningen, Correcting Arnold's mistakes.

October 4, Dr. M.C.M. de Jong, CDI - DLO, Lelystad, Odo's acquaintances: How many are there and how does that influence the spread of ideas?

October 4, Prof.dr. W. Alt, Univ. of Bonn, Germany, Path integration and search strategies of desert walkers

November 28, Dr. J. McNamara, Univ. Bristol, UK, State dependent life history evolution.

December 8, Prof. P. Abrams, Dept. of Zoology, Univ. of Maryland, USA, interactions in variable environments.

N. Overig:

Dr. D.J. Kornet was appointed Special Professor in Philosophy of Biology from 1 January 1995. She gave her inaugural lecture, "De liefde voor de wetenschap", on 27 October 1995.

Hans Metz has been appointed as scientific leader of the adaptative dynamics network, IIASA, Laxenburg, Austria.