



Photo: Staff of Austrian Research Institute for Artificial Intelligence. On the left side of the computer: Prof. Robert Trappl (with beard).

THE AUSTRIAN RESEARCH INSTITUTE FOR ARTIFICIAL INTELLIGENCE (OF AI)

The institute was founded in 1984 to make Artificial Intelligence (AI) technology accessible for Austria and to develop applications for research in this field. The initiative came from the Austrian Federal Ministry for Science and Research, which continuously supported us in our efforts. Some of us had been working in this field since 1977 – we had developed an expert system and a natural language understanding system for German. Some of our staff had also gained AI-experience abroad.

We were designated a “key institute” for Artificial Intelligence within the framework of a federal development program. We work closely together with the Department of Medical Cybernetics and Artificial Intelligence of the University of Vienna. The Austrian Federal Ministry for Science and Research is represented on our board of trustees, as well as the following commercial enterprises: Creditanstalt-Bankverein, Elin-Union, Girozentrale, Hewlett-Packard, Prime, Symbolics, Texas Instruments, Unisys and Xerox.

Products developed at our institute are already being marketed by distributors in 16 countries. All of the three multinational research projects we co-sponsored were accepted for promotion within the framework of COST-13, an action of the European Common Market.

Many of our staff are lecturers at the University of Vienna as well as at Vienna’s University of Technology. We have been organizing intensive seminars on artificial intelligence, and our cooperating university department offers courses in this field. We have the following computer

equipment: two LISP-machines Symbolics 3640 for fast interactive development of AI-software, several PCs and several terminals connected to a timesharing system.

CORE RESEARCH AREAS:

- Expert systems, knowledge-based systems, knowledge engineering tools.
- Knowledge-based natural language processing systems (for German)
- AI software for the PC
- Future and impacts of AI

SERVICES WE OFFER:

- Consulting in AI-technology
- Development of AI-products in cooperation with commercial enterprises.
- Counselling and assistance with the establishment of an AI-division and/or working group within a company.
- Counselling for the marketing of AI-products.
- Support and counselling for the introduction of AI-programs and AI-methods into commercial enterprises.
- Distribution of AI-software products developed by our institute through OEMs and software houses.

ADDRESS, TELEPHONE NUMBER:

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NO NEED FOR COMMUNICATION?

Stephen Sokoloff

A new age may soon be at hand. To understand what I mean, you just have to study the rights diagrams. Connecting a certain box in the third row from the top with a circle somewhere down below could be equivalent to a quantum leap; that would make ordinary transfer of knowledge a thing of the past. It is nearly impossible to divine the wonders that await us in the era of metacommunication.

Ivory tower scholars are often victims of their own utopian visions. Dreaming of a distant paradise, one can ignore the medieval incompetence of our own information exchange processes. Our Newsletter can serve as an example. I have heard that in one European country this publication isn't mailed to its readers until weeks after it arrives. The package of Newsletters just lies around on a desk somewhere until the recipient finally decides to take it to the organization headquarters in another town.

Some of the Newsletters we send abroad never even get to their destination; they are simply returned to us. It seems that the organization to whom they are addressed has vanished into the Bermuda Triangle. Nobody can (or is

willing to take the trouble to) divulge us the current whereabouts of the president.

The communication between the Newsletter and its readers also leaves much to be desired. Rarely has anybody been ready to send us critical and survey articles. At some points I have believed that IFSR members are mostly an indifferent and passive lot, without any real opinions or ideas. I sincerely hope that future contributions will prove this suspicion to be unfounded. The situation does seem to be getting a bit better, as you can see from the current issue of the Newsletter.

I would be the last person to question the importance of highly specialized studies. Still, a preoccupation with such disciplines sometimes serves to conceal a lack of ordinary communicative skills. Our intellect often leads us to increasing levels of abstraction – and isolation! Somehow, we must learn to strike a balance. Educated people who refuse to engage in a generally comprehensible discussion are ultimately condemned to societal irrelevance.

REALISM ACCORDING TO MACH, CARNAP AND GÖDEL

Lecture sponsored by the Depts. of Systems Theory and of Philosophy, Johannes Kepler University, Linz, 29 Jan. 1987; held by

ECKEHART KÖHLER,

Institute for Advanced Studies, Vienna, and Institute for Statistics and Computer Science, University of Vienna

THESES

1. According to Mach's monism, physical objects are just as real as mental objects (dual nature of elements). Therefore, as no elements are absolutely fundamental, they can in principle always be analyzed as theoretical **complexes** of other elements.

2. But "complexes" are mathematical **functions** (of elements), which in turn were conceived of by Mach as subjective operations (anthropomorphic finitism); therefore a) restriction of empirical concept-formation capability (differentials and other transfinite concepts are "fictions") and hence of the concept of reality, although b) elements and their complexes taken prima facie as subjective are re-**objectified** by considering them to originate in socially and biological (i. e. evolutionarily) anchored methods of gaining knowledge.

3. Carnap's "Principle of Tolerance" readmits all the concept-formation capability of classical mathematics, but at the cost of the indefiniteness of their interpretation (whether concepts are syntactical-nominalistic or subjective, etc.). However **Carnap's pragmatic conventionalism** is otherwise compatible with Mach's evolutionary utilitarianism. Carnap's prima facie subjectivist conventionalism becomes re-**objectified**, like Mach's method, through the use

of pragmatic criteria.

4. Gödel defends an apparently absolute realism for mathematics and postulates an intuitive perception (a 6th sense) for it. (An intentionally theological standpoint is required for the foundation of mathematics: the objectivity of mathematical rules lies in the validity of god-like, i. e. transfinite procedures.)

5. But Gödel's standpoint seems to coincide with Carnap's after all, as Gödel emphasizes the **fallibilism** of mathematical intuition, allowing even its **probabilistic** interpretation – which necessarily results in a **utilitarian** foundation for mathematics, comparable to a pragmatic conventionalism.

6. Since utilitarian foundations always depend on historically contingent interests and informational states, they are always subject to further criticism and revision when necessary; but they can nevertheless (or perhaps for that very reason) be extremely **robust** – like democracy! Conclusion: the subjective/objective distinction is of little consequence – what's important is the dependability of the source of information; on the other hand, if realism is defined as **absolutism**, then there are two alternatives. Either a) the revisibility of "knowledge" and of conceptual schemes is regarded as incompatible with realism and hence the acceptance of fallibilism renders realism **false**. Or b) realism is regarded as compatible with revisions so long as these tend to a robust issue in the limit, in which case accepting the hypothesis of robustness renders realism **true**. But the latter is a good **working hypothesis**, because it facilitates individual and interpersonal dealings (Boltzmann's "Zweckmäßigkeit").

REVIEW OF UKSS WORKSHOP, 26 AND 27 MARCH 1987, AT CITY UNIVERSITY

Bob Flood Dept. of Systems Science, City University, U. K.

This short review aims to summarise some of the ingredients and outcomes of the activities of the workshop, which was attended by 54 members. Of those attendees, there was a mixture of academics and industria-

lists, and (encouragingly) many new, as well as the more established, members.

Professor Peter Checkland gave an interesting and entertaining talk on the future of the systems movement.

He took the view that the significant successes of systems engineers/analysts at "solving" structured problems, up to and including the 1960s, gave rise to over-enthusiasm for the application of such approaches to "social systems". The gist of his argument was that these latter applications seriously affected the credibility of systems practice, which has to some extent recovered in the 1970s, with the appreciation that "social systems" can at best be viewed as notional (speculative). The rise of soft systems methodology, for instance, was seen as the foundation for future systems practice. This talk gave rise to much debate, and various viewpoints were aired. Professor Philip M'Pherson presented a lecture on "Practical Solutions". His approach concerned the use of contemporary, and more sophisticated (than the approaches of the 1960s) systems engineering. New ideas and techniques were highlighted as, in his view, the way into soft problems. Investigating problems with the aid of achieving structure was one of the fundamental themes of his lecture.

The next activity involved the members, then partitioned into syndicate groups, discussing the topic – "Systems Thinking is Academic in Culture and Does Not Work in the Real World".

Professor Ludwick Finkelstein "listened in" to all the debates and then acted as chairman for the syndicate summaries, synthesis and discussion, at which all participants were present. Presentations by members of each syndicate were optimistic. In Professor Finkelstein's synthesis, one important point he made concerned the ex-

clusive concentration on management and organisational studies (reflecting the interest of the participants), whilst other successful areas such as biomedical modelling, studies in ecology and conflict analysis (examples of many additional areas of interest in systems science) were not discussed. This raises some questions for the Committee concerning the feasibility of catering for such a "broad church".

A number of the participants presented a brief overview of their research under the umbrella title – "Current Applications of Systems Ideas". The presenters and topic areas were: D. Avison, information systems in community health; L. Davies und P. Ledigton, the use of metaphorical models in soft systems studies; P. Gaisford, vice in the West End of London; C. Lay, how a supposedly minor writing task led her to adopting a recognised systems methodology; D. Powell, an organisational study into energy efficiency in defence estate; C. Hulley, application of SSM to problems arising from the attitudes of police officers and the police subculture; W. Reckmeyer, renaissance systems practice.

The success of an event such as our workshop is difficult to quantify. Clearly there is enthusiasm in the UK for matters of systems science, as reflected by the rising membership rate and the unexpectedly large number of participants. From the Committee's viewpoint the rousing applause at the end of Friday's activities was some measure of the workshop's success, and encourages us greatly for the work ahead.

The Austrian Society for Cybernetic Studies (Österreichische Studiengesellschaft für Kybernetik) in cooperation with The University of Vienna Department of Medical Cybernetics and Artificial Intelligence would like to invite you to submit papers to

EMCSR 88

Ninth European Meeting on Cybernetics and Systems Research, Vienna, April 5 – 8, 1988

CHAIRMAN:

Robert Trappl, President
Austrian Society for Cybernetic Studies

SECRETARY GENERAL:

Michael Schulte-Derne

PROGRAMME COMMITTEE:

K. Balkus (USA)	M. Peschel (GDR)
B. Banathy (USA)	F. Pichler (Austria)
G. Broekstra (Netherlands)	G. Porenta (Austria)
C. Carlsson (Finland)	J. Retti (Austria)
G. Dorffner (Austria)	L. M. Ricciardi (Italy)
W. W. Gasparski (Poland)	N. Rozsenich (Austria)
R. Glanville (UK)	R. Trappl (Austria)
W. Horn (Austria)	L. Troncale (USA)
N. C. Hu (China)	H. Trost (Austria)
H. Huebner (Austria)	Ya. Tsyarkin (USSR)
G. J. Klir (USA)	S. A. Umpleby (USA)
O. Ladanyi (Austria)	R. Vallee (France)
G. Pask (UK)	J. Warfield (USA)

ORGANIZING COMMITTEE:

G. Broeckner	E. Plechl
E. Buchberger	J. Retti
W. Horn	M. Schulte-Derne
P. Hotko	R. Trappl
F. Pichler	H. Trost

CONFERENCE FEE:

Contributors: AS 1600 (Austrian Schillings) if paid before
January 31, 1988

AS 1900 if paid later

Participants: AS 2500 if paid before January 31, 1988

AS 2900 if paid later

Exchange rate: 13 AS are about \$ 1,- in U. S. currency at present

EMCSR 88 Secretariat

**Österreichische Studiengesellschaft für Kybernetik
A-1010 Wien I, Schottengasse 3 (Austria)
Telephone (0222) 5353281-0**

European Meetings on Cybernetics and Systems Research have been held in Vienna every two years since 1972. At the last one, in 1986, 160 scientists from 24 countries met to present, listen to and discuss 130 papers. Because of the overwhelming success of this previous meeting we are organizing the 1988 conference.

A number of symposia will be arranged and we are grateful to the colleagues who have undertaken the task of preparing these events. As on the earlier occasions, eminent speakers of international reputation will present the latest research results at daily plenary sessions.

SYMPOSIA:

- 1 General Systems Methodology
G. J. Klir and L. Troncale, USA
- 2 Designing and Systems
B. Banathy, USA, and W. Gasparski, Poland
- 3 Humanity, Architecture and Conceptualisation
G. Pask, UK
- 4 Cybernetics in Biology and Medicine
L. M. Ricciardi, Italy and G. Porenta, Austria
- 5 Cybernetics of Socio-Economic Systems
G. Balkus, USA and O. Ladanyi, Austria
- 6 Fuzzy Sets and Systems: Expert Systems and Approximate Reasoning
C. Carlsson, Finland
- 7 Computer-Aided Systems Theory (CAST)
F. Pichler, Austria and A. W. Wymore, USA
- 8 Robotics and Flexible Manufacturing
S. Aida, Japan and P. Kopacek, Austria
- 9 Systems Engineering for Peace Research
H. Chestnut, USA, F. Breitenacker and P. Kopacek, Austria
- 10 Artificial Intelligence
H. Coelho, Portugal and H. Trost, Austria
- 11 Parallel Distributed Processing in Man and Machine
D. E. Rumelhart, USA and G. Dorffner, Austria
- 12 Innovation Systems in Business and Administration
G. Rosegger, USA and H. Huebner, Austria
- 13 The Management and Cybernetics of Organizations
M. U. Ben-Eli, USA and G. Probst, Switzerland

TUTORIALS:

We plan to organize two half-day tutorials, one on Management Cybernetics, the other one on Artificial Intelligence. Kindly tick the appropriate square on the reply form for registration.

SUBMISSION OF PAPERS: Acceptance of contributions will be determined on the basis of **Draft Final Papers**. These papers must not exceed 7 single-spaced A4 pages, in English. They have to contain the final text to be submitted. Graphs and pictures need not be of reproducible quality, however. The Draft Final Paper must include the title, author(s) name(s), and affiliation in this order. Please specify the symposium in which you would like to present your paper. Each scientist may submit only one paper. Please send **3** copies of the Draft Final Paper to the Conference Secretariat (**not** to symposium chairman!)

DEADLINE FOR SUBMISSION: October 15, 1987

In order to enable careful refereeing, Draft Final Papers received after the deadline cannot be considered.

FINAL PAPERS: Authors will be notified about acceptance no later than November 20, 1987. They will be provided by the publisher of the proceedings with the detailed instructions for the preparation of the Final Paper.

PRESENTATION: It is understood that the paper is to be presented at the meeting by the contributor himself.

HOTEL ACCOMODATIONS: will be handled by Österreichisches Verkehrsbüro, Kongreßabteilung, Opernring 5, A-1010 Vienna, Tel. (0222) 588000, telex 111 222. Reservation forms will be sent to all those returning the applications (see below).

NINTH EUROPEAN MEETING ON CYBERNETICS AND SYSTEMS RESEARCH

- I plan to attend the Meeting.
- I intend to submit a paper to Symposium ...
 - I enclose the Draft Final Paper.
 - My Draft Final Paper will arrive prior to October 15, 1987.
 - I am interested in participating in the tutorial(s) on Management Cybernetics / Artificial Intelligence.
- My cheque for AS covering the Conference Fee is enclosed.
- I shall not be at the Meeting but am interested in receiving particulars of the Proceedings.
- I hereby order the following reports of the ASCS.
 - I enclose a cheque for AS (please add AS 30.- for postage)
 - Please bill me.

Name: Prof./Dr./Ms./Mr.

Address

Date: **Signature:**

Send to **EMCSR SECRETARIAT** *(Address: see above)
An **Informal Session about Bertalanffy and his influence systems science** could also be included in the EMCSR 88 conference, if there is sufficient interest. If you would

like to participate, please write to the chairman, Prof. Richard Jung, University of Alberta, Edmonton, Alberta, Canada T6G4H4. Prof. Franz Pichler, Linz, Austria, will be the co-chairman.

Offenlegung:

Der „IFSR Newsletter“ erscheint in unregelmäßigen Abständen in englischer Sprache unter der Redaktion von Dr. Stephen Sokoloff. Die Zeitschrift dient der Information über die Aktivitäten der IFSR. Sie wird kostenlos an Mitglieder ihrer insgesamt 16 Mitgliedsorganisationen in 13 Länder versandt. Die Kosten werden von der IFSR aus den Beiträgen der derzeit 16 Mitgliedsorganisationen getragen. Präsident der IFSR ist für 1986/88 Prof. Dr. Robert Trappl (Österreich), Vizepräsident Dr. Bela H. Banathy (USA), Sekretär-Schatzmeister Prof. Dr. Gerard de Zeeuw (Niederlande). Alle Funktionen werden ehrenamtlich ausgeübt. Druck: CIWA-Grafik, 4040 Linz-Puchenuau. (To our readers: To comply with the Austrian "Media Act" every Publication must contain a declaration such as the above one concerning ownership and purpose at least once a year.



DEPARTMENT OF SYSTEMS SCIENCE

RESEARCH PROGRAMME

Opportunities are available for suitably qualified graduates with first or upper second class honours degrees to undertake research leading to the M. Phil. or Ph. D. degree. A number of Research Council Studentships are expected to be available. The three research programmes are:

SYSTEMS SCIENCE PROGRAMME

MEASUREMENT AND INFORMATION IN MEDICINE.

Mathematical modelling of physiological systems; computer-aided medical decision-making.

REHABILITATION SYSTEMS. Application of systems approach and information technology to the needs and problems of disabled people.

GENERAL SYSTEMS. Fundamental studies in systems structure, modelling and theory.

ENGINEERING MANAGEMENT PROGRAMME

SYSTEMS ENGINEERING. System design management; reliability and safety; logistics engineering; life cycle costing.

INDUSTRIAL ENGINEERING. Engineering business management; operations and production management; quality assurance; project management.

SYSTEMS MANAGEMENT. Systems of management and control for engineering business; organisation design; management of innovation and change.

DECISION SUPPORT SYSTEMS. Technological risk analysis and assessment; strategic decision making.

INDUSTRIAL STRATEGY. Market-oriented strategy formulation for engineering business; product strategy; regional development strategy; technological portfolios.

COMPUTER-AIDED INTERACTIVE MANAGEMENT. Decision sciences; structural modelling; interactive management; computer-aided decision making; problem solving in organisations.

INTERNATIONAL RELATIONS AND CONFLICT MANAGEMENT PROGRAMME

CONFLICT MANAGEMENT. Development of structures and processes for managing conflict and change within and between complex social systems.

ANALYSIS OF POLITICAL SYSTEMS. Modelling of political processes. Analysis of international contention over specific issues.

POSTGRADUATE AND POSTEXPERIENCE COURSES

A range of postgraduate and postexperience courses is currently being developed in the field of Engineering Management. These are expected to be available for the first time in 1988.

Further information from: Prof. E. R. Carson, Senior Tutor (Research), Department of Systems Science, The City University, Northampton Square, London EC1V 0HB.

LIST OF MEMBERS OF IFSR updated July 1987

American Society for Cybernetics
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The Cybernetics Society (U. K.)
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Vice-Chairman
c/o School of Pharmacology
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The Society of Management Science and
Applied Cybernetics (SMSAC) (50)
Secretary: Prof. A. Ghosal
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Gesellschaft für Wirtschafts- und
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*Address seems incorrect. We hope to provide new address soon.

MEETINGS and COURSES

Title	Date	Place	Deadlines	Further Information
X. IFAC World Congress	27-31 July	Munich F. R. Germany	-	Eng. H. Wiefels VDI/VDE Gesellschaft Meß- und Regelungstechnik GMR Postfach 1139 D-4000 Düsseldorf 1, FRG
2nd IFIP Conference on Human-Computer Interaction	1-4 Sept.	Stuttgart F. R. Germany	15 March 1987 Final text must be there!	Interact '87, Secretary c/o IAO/IPA Nobelstraße 12 D 7000 Stuttgart 80, FRG
XIth International Congress of Mathematical Biology	7-9 Sept.	Paris France	1 May 1987 Summary of paper	Secretariat de la Société Inter- nationale de Biologie Mathématique 11 bis avenue de la Providence 92160 Antony, France
World Organisation of General Systems and Cybernetics Seventh International Congress	7-11 Sept.	London U. K.	30 Nov. 1986 Abstracts	Professor J. Rose 5 Margate Road Lytham St. Annes, FY83EG Lancs, England (Tel. 0253725114)
Operational Research Society Annual Conference 1987 OR 29	8-11 Sept.	Edinburgh Scotland U. K.	-	Operational Research Society Neville House Waterloo Street Birmingham B2 5TX Tel. No. 021-643-0236
12. Symposium on Operations Research	9-11 Sept.	Passau F. R. Germany	15 Febr 1987	Prof. Dr. Dr. F. J. Radermacher Lehrstuhl für Informatik und Operations Research Universität Passau Innstraße 27 D-8390 Passau, FRG
Österreichische Artificial Intelligence Tagung 1987	22-25 Sept.	Vienna Austria	-	Österreichische Gesellschaft für Artificial Intelligence "ÖGAI-Tagung 1987" Postfach 177 A-1014 Vienna, Austria
Gesellschaft für Wirtschafts- und Sozialkybernetik Jahrestagung	9-10 Oct.	Heidelberg FRG		Prof. Dr. Roland Fahrion Lehrstuhl für Wirtschaftsinformatik Wirtschaftswissenschaftliche Fakultät der Universität Heidelberg Grabengasse 14, D-6900 Heidelberg, FRG
Ninth European Meeting on Cybernetics and Systems Research	1988 5-8 April	Vienna Austria	15 Oct. 1987	Prof. Robert Trappl Dept. of Medical Cybernetics & AI Freyung 6 A-1010 Vienna, Austria
4th International Conference on System Science in Health Care	4-8 July	Lyon France	Sept. 1987 Abstracts Dec. 1987 typed papers	G. Duru, director G. S. Sante Lyon 1. Bat. 101 43 BD DU 11 novembre 1918 F-69622 Villeurbanne France
4th IFAC Symposium Computer Aided Design in Control and Engineering Systems	23-25 August	Beijing (Peking) People's Republik of China	15 April 1987	Prof. Chen Zhen-Yu Cadcs '88 Secretariat Application Committee of the Chinese Association of Automation P. O. Box 919 Beijing, PRC
IFAC/IFORS Symposium Identification and System Parameter Estimation	27-31 August	Beijing (Peking) People's Republic of China	15 April 1987	Prof. Chen Han-Fu Institute of Systems Sciences Academia Sinica Beijing, 10080, P. R. China
3rd International Symposium on Systems Analysis and Simulation	12-16 Sept.	Berlin GDR (East Germany)	1. Dec. 1987	Mrs. Böttcher Zentralinstitut für Kybernetik und Informationsprozesse Kurstraße 33 DDR-1086 Berlin