Council Meets in Singapore
Activity Development Board Also Convenes

The IFIP Council and several IFIP committees met in Singapore 9-12 March to discuss a large number of IFIP's concerns. Among the more important areas covered were the activities of IFIP Technical Committees (TCs), work in developing countries, the 11th World Computer Congress (IFIP Congress '89), and the relationship between Affiliate Members (AMs) and IFIP.

The week began with meetings of the Executive Board and several committees. Then the Activity Development Board (ADB) met for two half-day sessions immediately prior to the Council meeting. Its membership comprises all TC chairmen and AM representatives, as well as several General Assembly (GA) members and IFIP officers. Because the ADB is responsible for overseeing all of IFIP's technical activities, many participants consider the ADB meeting to be the most important one of the week. Unfortunately, only three of the nine TC chairmen were able to be present in Singapore. Following the ADB, the Council met for 1½ days.

Mr. Ashley Goldsworthy (AUS) called to order the first Council meeting he has chaired since becoming president of IFIP last September. Council was welcomed by Mr. Robert Iau (Singapore), the representative of the South East Asia Regional Computer Confederation (SEARCC) to IFIP, and an IFIP trustee. Welcome was also extended by Mr. T.-L. Wee, president of the Singapore Computer Society. During the week, attendees had an opportunity to meet members of the host organizations and representatives of the computer industry in Singapore.

State of the Art Seminars
TC activities were the focus of the ADB and Council meetings. An unusual request came from the Technical Committee on Programming (TC2), for approval of two "state-of-the-art" seminars—one, Formal Description of Programming Concepts, organized by the Working Group on Formal Description of Programming Concepts (WG2.2), and the other, Database Principles and Concepts, organized by WG2.6 on Database. The proposed seminars will be presented by members of the organizing WGs who are noted contributors to in-

continued on page 2

Gallaire is Cong. '89 IPC Chairman

At the March meeting of the IFIP Council in Singapore, IFIP president Mr. Ashley Goldsworthy (AUS) announced the appointment of Dr. Hervé Gallaire (F) as chairman of the International Program Committee for IFIP Congress '89, the 11th World Computer Congress. (The appointment of Prof. Stephen Yau (USA) to the chairmanship of the Organizing Committee was reported on page 3 of the March 1986 IFIP Newsletter.)

Dr. Gallaire was a member of the International Program Committee for IFIP Congress '86 and is well qualified to lead the IPC for Congress '89. He graduated from the Ecole Nationale Supérieure des Arts et Métiers and obtained Master and Ph.D degrees from the University Of California (Berkeley) in theoretical computer science. In 1970, he was named Professor of

continued on page 3
formation processing; the seminars will summarize the state of the art in their fields; and they will be presented to information processing professionals in developing countries. For each seminar, the speakers will prepare publications, which may serve as text books and important reference works. These seminars will differ from typical IFIP events, which are organized for scientists at the frontiers of information processing. Preliminary plans call for the seminars to be delivered in Latin America in 1988 and Southeast Asia in 1989. ADB and Council expressed approval for these activities, subject to the resolution of funding issues.

Dr. Richard Mason (CDN), TC2’s chairman, also presented a proposal for a new WG on Functional Programming (a field related to expert systems). ADB and Council supported the proposal, which will be presented for approval by the GA in September.

Another proposal, advanced by IFIP trustee Prof. Alex Verrijn-Stuart (NL), called for establishment of a WG on Artificial Intelligence. Dr. Mason was appointed chairman of a Task Group that will investigate this matter and report to the ADB in September.

Other actions related to TC activity included an ADB recommendation that the annual reports of the TCs contain material summarizing the major technical issues and the current state of IFIP’s work in their areas. These reports could be reproduced by GA representatives and distributed to their constituents as appropriate. This action was taken in response to a request from Mr. Chris Potter, GA representative of New Zealand. TC chairmen were also asked to appoint TC members to provide liaison with the Publications Committee and serve as Correspondents to the IFIP Newsletter. Conference Officer Mr. Jean Navez (B) reported on a database he is accumulating that contains names, addresses, and areas of interest of individuals who receive the IFIP Newsletter or have attended recent IFIP events.

**Activities in Developing Countries**

Mr. Luis Penedo (P), IFIP trustee and chairman of the Developing Countries Support Committee (DCSC), formerly called IFIP Committee: Informatics for Development (ICID), presented its report. Regional Coordinators have been appointed for the developing countries (DCs) in five geographical areas. Country profiles are being assembled to determine the needs of all DCs and how IFIP can help satisfy these needs. Support to the DCs will be provided primarily by IFIP’s human resources rather than monetary resources. (See the article on DCSC on page 4.)

Plans for IFIP Congress ’89, to be held in San Francisco 28 August-1 September 1989, were put forward. Newly appointed International Program Committee chairman Dr. Hervé Gallaire (F) presented his proposal for the Congress program, which gives a much greater stress to applications than prior Congresses. Organizing Committee chairman Prof. Stephen Yau (USA) presented a timetable for events related to the Congress. He also proposed a tutorial program to be held immediately prior to the Congress, and tours to major research laboratories, universities, and industrial plants in the San Francisco area. (See the article on Congress ’89 on page 1.)

Mr. Dudley Dolan (IRL), Organizing Committee chairman of Congress ’86, reported to Council on the financial outcome. While there was a very high international attendance, the numbers fell well below the organizers’ expectations, resulting in a substantial loss for the organizers. IFIP is working with them to ameliorate the financial situation.

Mr. James Finch (CDN), chairman of the Site Selection Committee, reported that formal proposals have been received for holding Congress ’92 in Amsterdam, Madrid, Singapore, and Sofia. The committee will request further information and then present its recommendation to the GA, which will make the final choice in September.

**Affiliate Members**

The relationship of IFIP with its Affiliate Members (AMs) is a major concern and was deliberated extensively by the ADB. Mr. George Glaser (USA), IFIP vice-president and chairman of the ADB, will serve as chairman of a committee that will determine what services IFIP might provide for its AMs. (See the article on page 9.)

Concern was expressed regarding IFIP’s financial situation. Mr. Owen Dalton (IRL), IFIP’s treasurer, reported a loss of approximately 88 000 Sfr. in 1986 and the potential for a larger loss in 1987. Since the assets of IFIP amount to approximately 1 000 000 Sfr., the Federation can tolerate a year or two of losses, but clearly not indefinitely. An automatic dues increase for 1987 of approximately 11% (related to the cost-of-living in Switzerland) and the upward reclassification in the dues structure of 7 Full Member nations will increase the income. Also, royalties are expected to increase in 1987. Procedures are to be established to encourage rapid repayment of loans granted by IFIP for technical meetings. Discussions in the Publications and Marketing Committees were concerned with expanding the distribution of IFIP books, as means both of promulgating IFIP work and increasing IFIP revenues. Finally, Mr. Dalton will request more accurate budget figures from committee chairmen, so that IFIP can plan its finances more accurately.

**Marketing Committee Proposal**

A controversial proposal was presented by Mr. Hennie Leroux (ZA), IFIP trustee and chairman of the Marketing Committee (formerly called the Public Information Committee). It suggests that a corporation be formed to market IFIP “products,” in order to better disseminate the technical work of IFIP. Increased income is required to support further IFIP growth. Moving into areas of new products (e.g., the state-of-the-art seminars proposed by TC2) will call for additional resources—people and finances—not available in IFIP. The company would operate full time, utilizing existing IFIP resources and developing new products based on these resources. The company would be formed with a suitable partner on a 50-50 ownership basis, and the net income would be split 50-50. IFIP’s contribution would be the ownership of a vast wealth of expertise in information technology; the partner would contribute the working capital. IFIP would retain control by appropriate representation on the board of directors. The benefits accruing to IFIP would include a greatly increased worldwide distribution of the results of IFIP’s work, financial strength to extend IFIP’s work, especially to developing countries, a full-time executive director, enhanced secretarial facilities, and an “umbrella” for Affiliate Members. This proposal will be deliberated by the GA in September.

Changes in IFIP membership were reported: Sri Lanka has joined SEARCC, becoming its ninth member; Algeria has been dropped from membership in IFIP; Centro Latinoamericano de Estudios en Informatica (CLEI), a regional confederation approved for membership in IFIP in 1984, has yet to
join IFIP. At present, IFIP has 42 Full Members, including the regional member SEARCC, and 7 Affiliate Members.

Other items of interest covered by Council include the following:

- A complete bibliography of IFIP publications will be ready for distribution in September.
- The Executive Board ruled that all events co-sponsored by IFIP must adhere to the policy established for events organized solely by IFIP: the organizers and the host country must guarantee the possibility of attendance by all bona fide participants, from all nations, and all IFIP personnel. (See the article IFIP Reaffirms Policies, on page 3 of the September 1986 IFIP Newsletter.)
- It was reported that IFIP vice-president Acad. Blagovest Sendov (BG) was appointed as one of the six vice-presidents of the Intergovernmental Informatics Committee (IIP) of the United Nations Economic, Scientific and Cultural Organization (UNESCO). He is serving as Bulgaria's representative. IFIP was invited to be an observer to IIP. (See the article about on page 10.)

CONGRESS '89 continued from page 1

Mathematics and Computer Science at Ecole Nationale Supérieure de l'Aéronautique et de l'Espace and worked on the development of an operating system in the computer science department of the Centre d'Etudes et de Recherches de Toulouse (CERT). In 1972, Dr. Gallaire was named head of the Computer Science department of CERT. He held both positions until 1980, when he joined the Corporate Research Laboratories of Compagnie Générale d'Électricité to create the research division for computer science. In 1984, he was named—and remains—Managing Director of the European Computer-Industry Research Centre in Munich, the joint research center sponsored by Bull, ICL and Siemens.

Dr. Gallaire's work ranges from theoretical computer science to artificial intelligence. He is associated with developments in logic and databases. He has written a book on compiling techniques and edited, with others, a series on Advances in Database Theory. He is a member of various French national advisory committees on computer science.

11th World Computer Congress

The 11th World Computer Congress will be held in San Francisco 28 August-1 September 1989. The previous Congress took place in Dublin in September 1986. Reports of it can be found in the December 1986 and March 1987 issues of the IFIP Newsletter.

The program will emphasize the Evolution of Information Processing. Its scope and organization will be geared toward EDP professionals and application systems designers and developers. It will have several components, organized around a small number of topics, covering research and developments in these fields. Involvement of IFIP's Technical Committees will be sought for a special stream of the program.

Prof. Yau, OC chairman, told the Council of the tutorial program to be organized immediately prior to the Congress. Three tutorials will be held on each of the two preceding days. In addition, tours to research laboratories, universities, and industrial plants will be conducted.

- The Council approved the hiring of a full time assistant to Mme. Gwyneth Roberts (CH), Administrative Manager of the IFIP Secretariat.
- A new edition of the IFIP Statutes and Bylaws was distributed in February.
- IFIP Newsletter editor Dr. Jack Rosenfeld (USA) reported that a recent survey of Newsletter recipients indicated a high degree of satisfaction with the publication. Council encouraged him to expand the distribution well beyond the current 2300 recipients.

The Council meeting was closed by Mr. Goldsworthy with many thanks to the participants. Mr. lau thanked those present for having come so far, quoting a Chinese saying: The greater the distance travelled, the greater the friendship.

The first Council meeting of 1988 will be held in Auckland, New Zealand 29 February-4 March. No invitation has yet been tendered for the March 1989 Council meeting. Council is considering holding that meeting in Geneva.
The first report of the Developing Countries Support Committee (DCSC) was presented by its chairman, Mr. Luis Penedo (P), an IFIP trustee, at the March meeting of the Council in Singapore. (See the article on page 1.) The DCSC, formerly called the IFIP Committee: Informatics for Development (ICID), was organized at the time of the IFIP General Assembly (GA) in August 1986. The following material, prepared by Mr. Penedo, is taken from the minutes of the organizational meeting.

Following are the main points covered in our meeting:

- The support IFIP can channel to developing countries (DCs) has two distinct levels: the academic level, providing state-of-the-art information in pertinent subjects; and general level, satisfying basics or literacy needs, at an educational or tutorial level.
- Our main IFIP resource is knowledge and experience, but not money. Money shall be used with care, always to promote the use of our main resource.
- Technical Committee (TC) chairmen, Cognizant Officers, and Affiliate Members will be contacted, to synchronize DCSC operations. We do not want to interfere with ongoing planned activities that may not require our support. We would like, however, to have all pertinent information related to TC and Working Group (WG) events happening in DCs or appropriate to them.
- IFIP’s publishers will be contacted for information on available IFIP books, to evaluate their usefulness to DCs.
- The DCSC structure includes Regional Coordinators for various regions of the world, but, for the sake of efficient operation, we will limit the Regional Membership to a maximum of 12. This way, we will have an opportunity to conduct Fast, creative, and efficient meetings. Coordinators will assemble country/region profiles and will promote informative sessions with representatives of countries in their regions at local or regional events.
- Regional Coordinators are responsible for:
  1. identifying resources or experiences in their own areas that are potentially applicable to other countries equally or less developed. These should be resources connected with IFIP, from TCs, WGs, other IFIP volunteers, including resources from IFIP member societies.
  2. identifying needs that can be answered through IFIP.
  3. identifying possible new IFIP activities that are needed in developing areas.
  4. coordinating the work to be done. This will include participation in a meeting at the time of the IFIP GA.
- Regional meetings will take place as appropriate.
- Future activities might include a DCSC newsletter and a series of IFIP books covering specific DCs and/or regional problems and concerns.

DCSC Aim and Scope

The proposed Aim and Scope of the DCSC is given here (to be presented for the approval of the GA in September, after discussion and possible amendment).

The Aim of DCSC is to promote the cooperation of IFIP with DCs through the use of IFIP experience, technical information and knowledge and to help DCs/areas in their specific needs and requests.

The scope of the Committee includes:

1. Furnishing useful and applicable information required by countries for their development and available in IFIP or by means of IFIP organization and structure, including member societies.
2. Gathering information related to specific needs in the DCs/areas, and potentially answered by specific IFIP or IFIP-related projects to be created.

Specific tasks of the DCSC will include:

a. to identify needs and requests from DCs/areas that may be answered by information and skills available at present in IFIP.
b. to keep track of IFIP events in DCs/areas, in order to try to maximize the results of resources and efforts already being used by IFIP.
c. to identify possible new contributions of IFIP and IFIP-related organizations, in fields of particular interest in DCs/areas.
d. to promote membership of DCs not yet in IFIP, as a result of this cooperation.
e. to interface with the IFIP-Unesco Liaison Committee and the IFIP Committee for International Liaison (ICIL) whenever appropriate and convenient for the success of joint initiatives with Unesco and other external entities.
f. to interface with IFIP TCs, WGs and Affiliate Members whenever necessary, convenient or requested, in order to discuss and provoke actions addressed to DCs’ identified needs and requests.
g. to give financial starting support to initiatives of cooperation between IFIP and DCs/areas, within reasonable limits.
h. to ensure internal and external visibility of this IFIP cooperation, and promote its continuous improvement and updating.
From 20 to 25 October 1986, IFIP's Technical Committee on Education (TC3) held a Conference, Tele-
teaching '86: Remote Education and Informatics, in Budapest. The participants included 53 individuals from Hungary and 44 from 20 other countries. Registrants came from as far away as Thailand, U.S.A., South Africa, and Japan. Also, 50 students and teachers from elementary and secondary schools in Hungary attended.

Mr. Gyöző Kovacs (H), chairman of the Program Committee, characterized teleteaching as follows: In teleteaching, or remote teaching, the subject matter (courseware) reaches the student by means of technical tools. During the course of training, teacher and student, in general, do not meet each other directly.

The program comprised 43 papers from 16 countries. In addition to the presentation of papers, there were demonstrations, a video film, and a small exhibit. The Conference was followed by a short course on MProlog, a logic programming language.

Mr. Peter Braun (H) was chairman of the Organizing Committee. The Proceedings, which were published in March by North-Holland, were edited by Dr. Frank Lovis (GB), Prof. Hermann Maurer (A), Mr. Kovacs, and Mr. Huba Bruckner (H).

At the end of the Conference, participants expressed interest in organizing a TC3 Working Group (WG) on "Distance Learning" and selected Mr. Kovacs as the acting chairman of the proposed WG. Dr. Wichit Srisa-pan (Thailand) offered to organize Tele-
teaching '87 in Bangkok in November or December 1987, and the participants chose him as Program Committee chairman for that Conference. Approval of the IFIP General Assembly (to meet in September in Budapest) is required before a new WG may be established.

Creative Teaching

Among the papers presented at the Conference was one that discussed very innovative programs in elementary schools, which illustrate how informatics can significantly enhance traditional educational material. The paper, Tele-
matics Services, Education and Culture, written by Mr. Gerard Loiseau (F), began as follows:

Open learning [remote education—Ed.] with the aid of audio-visual methods often makes use of Computer Aided Instruction (CAI). In France, however, forms of open learning are increasingly being developed which take advantage of on-line electronic information services (telematics) operating according to public standards. The advantage of these standards lies in their ability to make both text and graphics widely available. Such educational applications are newcomers. Although increasingly numerous, such educational uses still seem relatively hesitant about adopting telematics services, not only for wide distribution of information but also for creative teaching and technical training.

Mr. Loiseau then proceeded to discuss a particularly fascinating educational application:

To speak of creative teaching in connection with telematics services would certainly have brought a charge of heresy only three years ago. Since it was well known that telematics provided information services, it was difficult to think of it as an instrument of creative teaching. Yet, examples have made it possible to measure the attraction of this new form of creativity in teaching, fully involved as it is in aspects of communications, since the children are increasingly aware that their work can be referred to by their friends, parents and acquaintances, or simply by anyone with a Minitel [a videotex terminal—Ed.].

Further Innovations

For the future, these innovations have been suggested:

- From the technical standpoint, to use a videotex graphics software package installed on schools' nano-networks to allow novels to be illustrated, since it is very easy for children to produce graphic designs by composing directly onto the television screen with a light-pen. The software also makes text editing more flexible than is possible on the Minitel.
- From the educational standpoint, perhaps a more tutor-led approach to future novels, with a more precise choice of theme.

The paper concluded with these words:

This swift overview of the French experience in telematics leads us to think that this tool opens fresh horizons in the areas of education and culture. In certain cases, managing to handle the telematics tool may lead a wide public to express itself and to participate more fully in its daily environment.
The Fifth World Congress on Medical Informatics, MEDINFO 86, met in Washington, D.C. 26-30 October 1986, with 2856 attendees from 56 countries. The countries with the largest number of participants were U.S.A., The Netherlands, Canada, United Kingdom, and France. Some 275 papers comprised the program, selected from approximately 650 papers submitted from 41 countries. "This was the largest and most important meeting ever convened on the applications of computers in health care," said Dr. Thomas Piemme, chairman of the MEDINFO 86 Operations Committee.

Dr. Donald Lindberg, chairman of the MEDINFO 86 Organizing Committee, presided over the opening ceremonies, which included major addresses by Dr. Edward Feigenbaum (USA) and Sir Walter Bodmer (GB). Dr. Feigenbaum is known for his work in applying the principles of artificial intelligence to science and medicine, leading to the formation of the Stanford Heuristic Programming Project. Sir Bodmer is an expert in human and population genetics.

Transition in Medical Informatics

In the Foreword to the Proceedings, Profs. Jan van Bemmel (NL) and Edward Shortliffe (USA), chairman of the Scientific Program Committee, made the following remarks: *

The Fifth World Congress on Medical Informatics, MEDINFO 86, marks a special transition in this field: medical informatics is no longer in its infancy, but reaching adulthood; no longer just an art, but becoming a science. For that reason, MEDINFO 86, with its thousands of participants, has become a true scientific congress and not just a marketplace for the exchange of ideas.

In this Foreword we will clarify the growing impact of medical informatics on medicine and health care, the increase of the scientific level of this discipline, and the proliferation of systems and methods around the globe. The MEDINFO Congresses, held every three years, are an excellent offering of the International Medical Informatics Association (IMIA), the Special Interest Group of IFIP.

The Proceedings were edited by Drs. Roger Salamon (F), Bruce Blum (USA), and Mogens Jorgensen (DK) and published by North-Holland.

Approximately 15% of the papers presented at MEDINFO 86 were devoted to topics related to artificial intelligence (AI), up from 5% at MEDINFO 83. Dr. Feigenbaum's address, entitled Autoknowledge: From File Servers to Knowledge Servers, discussed the importance and future of AI methods to medical informatics and society, in general. Parts of it are quoted here: *

It has been said that when people make forecasts, they overestimate what can be done in the short run and underestimate what can be achieved in the long run. I have worked in medical informatics for twenty years and confess to being chronically optimistic about its progress. The gains have been substantial, even impressive. But we have only scratched the surface, and we must not lose sight of the point to which we are heading, however distant it may seem.

We are beginning the transition from data processing to knowledge processing. Though the computer is a universal symbol-processing device, we have exploited to date only its mundane capabilities to file and retrieve data (file service) and to do high-speed arithmetic. The researchers in artificial intelligence have been studying the techniques for representing human knowledge for computer use and the methods by which that knowledge can be used to reason toward the solution of problems, the formation of hypotheses, and the discovery of new concepts and new knowledge. These researchers have been inventing the knowledge servers of our future.

Knowledge is Power

At Stanford, Lederberg and I chose reasoning in science as our task, and began work with Buchanan and Djerassi on building a program that would solve chemical structure elucidation problems at a high level of competence: the DENDRAL program. What emerged from the many experiments with DENDRAL was an empirical hypothesis that the source of the program's power to solve chemical structure problems from spectral data was knowledge of basic and spectral chemistry. For DENDRAL, knowledge was power. Obvious? In retrospect, perhaps. But the prevailing view in AI at the time ascribed power to the reasoning processes—in modern terms, to the "inference engine," not the knowledge base. The knowledge-is-power hypothesis stood as a contra-hypothesis, awaiting further test and the accumulation of evidence.

Much evidence came in the 1970s. Medical problem solving provided the springboard. The MYCIN program of Shortliffe and others at Stanford was the prototype of the expert-level advisory system, now known as the expert system. The core of MYCIN was its knowledge base of rules for infectious disease diagnosis and therapy. Its reasoning process was simple (backward chaining), even ad-hoc in parts. But it was built as an integrated package of intellectual abilities. It could interact with a professional in the professional jargon of the specialty. It could explain its line of reasoning. And it had a subsystem that could aid in the acquisition of new knowledge by guiding an expert to find defects in the stored knowledge. Overall, MYCIN provided strong confirmation to the knowledge-is-power hypothesis.

At nearly the same time, other efforts in medical problem solving were providing similar results. At the University of Pittsburgh, the focus of the INTERNIST project was the construction of an enormous "electronic textbook" of the knowledge of internal medicine (Pople and Myers). With its current knowledge base of 572 diseases, nearly 4500 manifestations, and hundreds of thousands of links between them, INTERNIST has provided the strongest confirmation yet of the knowledge-is-power hypothesis.

High Levels of Competence

Thus, the dream of the computer that performs at a high level of competence over a wide variety of tasks that people perform well seems to rest upon knowledge in the task areas. The knowledge-is-power hypothesis has received so much confirmation that we can now assert it as the Knowledge Principle: a system exhibits intelligent understanding and action at a high level of competence primarily because of the specific knowledge that it contains about its domain of endeavor. A corollary of the Knowledge Principle is that reasoning processes of an intelligent system are generally weak and are not the source of power that leads to high levels of competence in behavior.

We have learned how to build intelligent artifacts that perform well, using knowledge, on specialized tasks within narrowly defined domains. An industry has been formed to put this technological understanding to work, and widespread transfer of this technology has been achieved. The first era of the intelligent machine is ending, but with many problems remaining to be solved.

* © IFIP

continued on page 7
IFIP has just published Computers and Society, In Search of Benevolence. This is the ninth in a series of articles describing the work undertaken by IFIP's Technical Committees (TCs) and Special Interest Group. It describes the activities of TC9, which is concerned with the Relationship between Computers and Society.

One citation expresses the essence of TC9:

"The computer is not just a tool that we can use to save time and effort. It is a tool that can change society. The computer is a tool that can be used to create new social structures and new ways of thinking." - Harold Sackman [chairman of TC9]

Earlier articles in the series discussed education, data communication, digital systems design, information systems, medical informatics, programming, industrial applications, and computer security. The author of all nine, working under the leadership of TC9, is the respected British journalist, Mr. Kenneth Owen. Copies of the new article, as well as many of the other eight, are available from the IFIP Secretariat.

AAD VAN WIJNGAARDEN
(1916-1987)

On February 9, 1987, Adriaan van Wijngaarden, one of IFIP's founding fathers, died at age 70. It was a very sad occasion for us, losing not only a distinguished scholar, but also one of the nicest and kindest persons to be imagined.

Educated as a mechanical engineer at the Technical University of Delft, where he also obtained his Ph.D., van Wijngaarden joined the Mathematical Centre in Amsterdam on January 1, 1947, shortly after its founding. It was the start of a distinguished career, which was to continue there until his retirement in 1981. Professor van Wijngaarden once explained his philosophy for the Centre as follows: "A three-pronged approach is needed: one must engage in the theory of computing, one has to be in the forefront of computer languages research and one must always do "something in the field of computer hard-ware." He himself considered natural languages an additional challenge.

His first assignment for the Centre was touring the U.K. and the U.S.A., finding out to what extent that new invention, the automatic calculating machine, might be of importance to a mathematical institute. If perhaps some eminent mathematicians of those days predicted that the computer would soon prove to have been only a momentary fashion, van Wijngaarden helped correct this view in a very decisive manner. Upon his return, he convinced the Centre's management that computing power is essential to applied mathematics and stimulating to the emerging discipline of computer science. And there was no better way to acquire such power than to build ones own machine! The result was ARRA (an electric relay machine). It was commissioned in 1952 by the group he headed at that time, of which G.A. Blaauw, E.W. Dijkstra, W.L. van der Poel and others would be members, themselves to become trailblazers in the world of computing. After ARRA there would be ARMAC and finally the fully transistorised Xl.

By the late fifties, however, it was recognised that designing computers was a job for industry. Developing ideas and concepts rather than their immediate practical implementation would henceforth be the guideline. Meanwhile, two new features had been conceived that are commonplace nowadays: the channel and the interrupt.

Being one of the pioneers in a field gives rise to excitement and curiosity. The rapid development of the computer's capabilities triggered an interest in the design of machine-independent, general purpose algorithmic languages. It was this area that van Wijngaarden turned to after the Centre gave up its immediate involvement with building computers as such. The outcome was to leave the world changed permanently. First a member of the international group that designed Algol 60, he subsequently became the major architect of Algol 68. Although not successful in the commercial sense, its conceptual depth is outstanding and its subsequent influence widespread.

Algol 68 was an IFIP project, which brings one to van Wijngaarden's contributions to this international body. In the most literal sense, he stood at its cradle. Vice-president of the precursor International Conference on Information Processing in 1959, representative of the Netherlands in the General Assembly (1960-1971), IFIP vice-president (1962-1964), and trustee (1967-1970) are only some of the activities which earned him the Silver Core in 1974. The professional involvement with TC1, Terminology (chairman 1967-1974), and TC2, Programming (member 1962-1971), probably meant even more to him. It is only fitting that in 1981 he should have been honoured at his retirement as the Director of the Mathematical Centre by an IFIP International Symposium on Algorithmic Languages.

Of the many honours he received, election to the Royal Dutch Academy of Sciences in 1959, selection as the first Honorary Member of the Dutch Computer Society in 1972, and receipt of the IEEE Computer Pioneer Award in 1986 (for his Algol 68 work) should be mentioned. But his most important distinction is the legacy he leaves behind. As a scientist, yes, but above all, as the wise and lovable person we shall always remember.

* Alex Verrijn-Stuart *
Computing Machinery) under the leadership of Mr. Niels Bech. Denmark’s first representative to the IFIP General Assembly. Mr. Melbye was involved with pioneering computer applications in both the private and public sectors. He spent the 1964-65 academic year at Carnegie-Mellon University (U.S.A.) as a visiting research scientist in information systems.

In 1971 he joined Sparekassernes Datacenter, the Danish savings banks’ data center, and became its General Manager in 1973, with a staff that grew to nearly 500. He implemented the first large, on-line system in the Danish banking industry and then became responsible for the development and implementation of a truly distributed system, with 6000 workstations, for the entire Danish savings bank industry.

Mr. Melbye became an independent consultant in 1984, specializing in the managerial and organizational aspects of informatics.

He is the author of a dozen papers on computer applications. In addition, he has served as a teacher and external examiner in computer education at several Danish universities.

Mr. Melbye began his official association with IFIP in 1978 as the representative of the Danish member society, the Danish Federation for Information Processing (DANFIP), which was created to provide the liaison between the Danish information processing societies and IFIP). His previous, informal relationship was that of a participant in the first four IFIP Congresses. He has been active in IFIP as chairman of the Admissions Committee, Finance Committee, and as acting chairman of the Statutes and Bylaws Committee. He was elected trustee in 1980, and in Dublin last September, the General Assembly elected him vice-president. (See the article on page 1 of the December 1986 IFIP Newsletter.)

Mr. Melbye lives in Holte, north of Copenhagen, with his wife Ellen and their four children. He enjoys listening to chamber music and—in the company of his closest friends—playing the cello.

## VIEWS ON INFORMATION SYSTEMS RESEARCH METHODS

by Dr. Hans-Erik Nissen (S) *

In September 1984, the IFIP Working Group on on the Interaction of Information Systems and the Organization (WG8.2) held a colloquium in Manchester on Information Systems Research—a Doubtful Science? (See the article on page 5 of the June 1985 IFIP Newsletter.) After the colloquium, the Working Group decided that the debate that had started should be stimulated to go on. To this end, a Task Group on Information Systems Research Methods was formed. In order to get more material for such a debate, the Task Group undertook a questionnaire investigation. Its results are summarized in the report Views in 1985 on Information Systems Research Methods. A copy of the report can be obtained from—

Dept. of Information and Computer Sciences University of Lund Solvegatan 14 A S-223 62 Lund, Sweden.

The questionnaire was sent to 257 researchers. Completed questionnaires were returned by 112. Others commented on the investigation without returning the questionnaire. The response indicates that many researchers share a concern about information systems research and the methods employed in such research. Many respondents took care to include parts of the field of information systems research outside their current, personal interest. In a similar fashion, many took a broad view of potentially useful research methods. A dilemma was exposed—namely, striking a balance between addressing relevant problems on the one hand and insuring reliability of research findings on the other.

The variety of views was large. In a number of instances, the views of respondents apparently contradicted each other. This suggests a number of additional questions to ask.

Taken as a whole, the responses and comments to this investigation indicate that debate is needed on relevant and valid information systems research and fruitful methods to perform it. To the extent that the investigation stimulates this debate and furnishes some material for it, it has been worthwhile.

The Task Group has considered producing a monograph on research methods. One of its purposes would be to make researchers aware of the variety of research methods which have recently emerged and which may be needed to gain a sound and thorough understanding of the many unresolved issues of the use and development of information systems. In May 1986, it was decided that a feasible way to produce such a monograph would be to make these and related issues the topic of a Working Conference entitled The Information Systems Arena of the 90s: Challenges, Perceptions, Alternative Approaches. Suggestions and questions about this Working Conference, to be held in May 1988 in Ithaca, N.Y., U.S.A., can be forwarded to the chairman of WG8.2:

Richard J. Welke
Methodworks Inc.
33KS Harvester Road
Burlington, Ontario L7N 3N2, Canada

or to the vice-chairman:

Hans J. Oppelland
Faculty of Economics, Chair of Info. Systems
Erasmus University Rotterdam
Postbus 1738, NL-3000 DR
Rotterdam, The Netherlands.
THE ROLE OF IFIP AFFILIATES
Many Views Presented

The role of Affiliate Members (AMs) within IFIP has long been a matter of discussion. Some AMs keep close ties to IFIP, regularly send representatives to IFIP meetings, and co-sponsor events with IFIP. Others have virtually no contact. IFIP would like to maintain close and productive relations with its AMs.

Following a discussion of the relationship of IFIP with its AMs at the August 1986 Activity Development Board (ADB) meeting in Dublin, the AM representatives present were requested to prepare a paper suggesting how the relationship might be improved. In response to this, Prof. Herbert Freeman (USA), representative of one of the AMs, the International Association for Pattern Recognition (IAPR), sent a memorandum to the ADB. This was discussed at length at the March ADB meeting in Singapore, which preceded the Council meeting. (See the article on page 1.)

Prof. Philip Enslow (USA), representative of the International Council for Computer Communication (ICCC), and IFIP president Mr. Ashley Goldsworthy (AUS) presented other aspects of the topic. Almost all agreed that an important component of cementing a good relationship is the degree of service that IFIP can provide the AMs. Mr. George Glaser (USA), IFIP vice-president and chairman of the ADB, is heading a committee to determine what services IFIP might provide.

The following is taken from Prof. Freeman’s memorandum. He has had a long relationship with IFIP, including serving as the International Program Committee chairman for IFIP Congress ‘74, so his thoughts deserve careful consideration.

Origins of Affiliate Membership

The IAPR was the first AM of IFIP, and the membership category of “Affiliate Member” was created largely at my urging. IAPR was a new organization at the time, and I believed that it was in the interests of both IFIP and IAPR to establish some kind of relationship. I felt that in time more and more special-interest organizations would be created, and that IFIP would be able to assume a kind of overall umbrella role if it invited these new organizations to become AMs. In this umbrella role, IFIP could help the new organizations establish themselves internationally, foster interaction among different such organizations, help to minimize unnecessary overlap of interests among the new organizations, maintain a central meeting calendar, and generally serve as a friendly “big brother” to them. The benefit to IFIP would be an increased importance as an international scientific coordinating organization whose interests and influence would continue to span the entire information processing field.

I felt that if IFIP did not accept this umbrella role, the new organizations would bypass IFIP, perhaps in time create their own central coordinating organization, and IFIP’s role in the world scientific community would diminish.

Today, information processing has become so specialized that most people in the field no longer want to attend just a “computer conference.” Instead they attend meetings on computer architecture, on computer communications, on pattern recognition, on computer graphics, etc. Many of these international meetings are today larger than the early IFIP Conferences. I am sure that eventually these meetings will in turn become too large and further specialization will take place. We already see this happening in IAPR. There is no use in bewailing this phenomenon; it is part of the natural development of our modern technological society, and it will happen whether we like it or not.

IFIP Needs the Affiliates

My view of the role of the IFIP AMs is no different than it was ten years ago. IFIP needs the AMs much more than vice versa. IFIP played an important role in the sixties and seventies. Times have changed. Because of the increasing specialization and fragmentation of the information processing field, there is much less interest in IFIP today. IFIP has to adapt to the changing conditions. A good possibility is for IFIP to move strongly into the position of serving as an international coordinating organization. The Institute of Electrical and Electronics Engineers (IEEE) did something similar in the U.S.A. Today it is the parent organization of a multiplicity of diverse-interest societies (of which one is the IEEE Computer Society with over 75,000 members).

To assume such an umbrella role, IFIP must actively recruit AMs and let them play a significant role. Some voting rights must be given, and some membership fees can be charged. Inevitably this means that the role of the present members will appear to diminish somewhat. However, in my opinion, if IFIP does not do this, the role of IFIP will diminish even more.

Perhaps an AM Council might be created, in which only the AMs participate. They might be able to elect one or two delegates, who would represent them collectively to IFIP.

Another role IFIP might be able to play is to offer to provide international office facilities to member societies on a competitive, cost-reimbursement basis. Some of the new international organizations are not yet able to set up their own secretariats but might be willing to buy such service from IFIP.

In summary, I feel that IFIP should actively attract into its fold AMs (or whatever else they might be called) representing the emerging new special-area international organizations. Only in this way will IFIP be able to remain a strong international organization, with a well-defined, up-to-date role to justify its existence.

VLDB ENDOWMENT JOINS IFIP

The VLDB General Assembly, in August 1986, voted to admit the Very Large Data Base (VLDB) Endowment as an Affiliate Member. (See the article on page 1 of the December 1986 IFIP Newsletter.) This Affiliate specializes in database management, including very large data bases, small data bases, "knowledge" bases, and related topics. The other Affiliate Members are the International Association for Pattern Recognition (IAPR), International Association for Statistical Computing (IASC), International Council for Computer Communication (ICCC), European Association for Microprocessing and Microprogramming (EUROMICRO), International Federation of Associations of Computer Users in Engineering, Architecture and Related Fields (FACE), and International Joint Conferences on Artificial Intelligence, Inc. (IJCAI).

The VLDB Endowment is an international body, currently composed of a Board of Trustees and an Executive Board. The president of the VLDB Endowment is Prof. Alfonso Cardenas (USA), its vice-president is Prof. Janis Bubenko (S) (who will serve as its representative to IFIP), and its treasurer is Dr. Gerald Wilson (USA).
The 33 member nations of the Committee convened on October 21, 1986. The Bureau was elected. Mr. Andre Danzin (F) was appointed Chairman of the IIP, and IFIP vice-president Acad. Blagovest Sendov, Bulgaria's representative to IIP, was appointed one of the six Vice-Presidents. IFIP was officially invited as observer as well as, among others, IBI [Inter-governmental Bureau for Informatics] and ICSU [International Council of Scientific Unions].

The major agenda items which occupied most of the discussion time were participation of member states in the IIP and the preliminary draft programme for 1988-1989. The various delegations expressed their views relative to their needs (developing countries) or to their potential contribution to the IIP (developed countries).

**IFIP's Position**

During the debate, I had the opportunity of expressing **IFIP's** position relative to IIP, which is summarized below:

- definition of **IFIP's** aims, operational structure, and principal activities (in order to explain the extent and the limits of **IFIP's** potential contribution)
- current level of cooperation between Unesco and **IFIP**, particularly in favour of developing countries; role of **IFIP's**
- Development of the above activities is predicated on—
  a. adequate funding from IIP
  b. a better knowledge of **IFIP's** resources and capabilities by the potential beneficiaries. To this effect, we suggest using the "focal points" and IIP correspondents (to be established in each country) as the official communication link with **IFIP**. As a first action point, we propose to put them on the mailing list for the *Information Bulletin, Six-Year Plan*, and **IFIP** Newsletter.

As expected, a precise programme could not be established during the meeting, but a document called "conclusions of the debates" was approved. Basically, the detailed programme will be established by the Secretariat and the Bureau during the next few months. Provision is made for the participation of **IFIP** in this work.

**IIP Tasks**

As a conclusion of the meeting, the Committee gave the Bureau authority to conduct the following tasks:

- appoint the local "focal points"
- prepare a directory of contributing organizations
- study the development of an information system on Informatics
- set up a Working Group to study the intersections of **IIP** with other Unesco programmes
- set up an external experts group
- evaluate the potential resources (financial, human)
- publicize the **IIP**
- launch the priority #1 action in education (especially the Congress "Informatics and Education")

The next **IIP** Committee meeting will take place at the end of 1988.

The International Conference on Very Large Data Bases, the annual event organized by the VLDB Endowment, is dedicated to the promotion and exchange of research and development among the peoples of all nations of the world in computerized data bases and data base technology and practice, and the many related areas. The first VLDB Conference was held in the U.S.A. in 1975, to help promote the international growth and evolution of this field. Subsequently, the conferences have been held in Belgium, Japan, West Germany, Brazil, Canada, France, Mexico, Italy, Singapore, Sweden, and Japan.

Attention is paid to the quality of the conference, as evidenced by a ratio of close to 6 to 1 between papers submitted for publication to papers accepted for presentation. Also, outstanding professionals have been invited to address the conference in panel sessions and tutorials.

The Conference attendance has grown from approximately 100 participants in 1975 to over 700 in recent years. During the same time, the number of papers submitted grew from 60 to 300. Only approximately 60 papers are accepted.

The thirteenth VLDB Conference will be held in Brighton 1-4 September. For information, contact—

Miss Christine Edginton, Conference Manager
BISL Conference Dept.
The British Computer Society
13 Mansfield St.
London W I M 6BP, United Kingdom
tel. +44 1 637 0471
telex 262284
NEW APPOINTMENTS
GA MEMBERS
Mr. A. Maharaj
Computer Solutions Ltd.
P.O. Box 355
Suva, FIJI
tel. 679.314 717
telex FJ 2127
Prof. M. Tienari
Helsinki University
Tukholmankatu 2
SF-00250 Helsinki, FINLAND
tel. 358 (0) 90-410 566
(succeeding H. Haglund)
Mr. M. Gottlieb
PA
P.O. Box 919
Ramat-Gan 52109, ISRAEL
(succeeding J. Raviv)

TC AND WG OFFICERS
TC3 Vice-Chairman
Prof. Rojlevangen 40
DK-2630 Taastrup, Denmark
tel. 45 (2) 52 77 58
WG5.3 Chairman
Prof. G. Oiling
Chrysler Motors
1 2000 Chrysler Drive
Park, MI 48288-1118, U.S.A.
(succeeding J.P. Crestin)
WG10.4 Vice-Chairmen
Prof. Y. Tolima (previously secretary)
Prof. J. F. Meyer

TC MEMBERS
TC3 R.M. Aiken (USA) (succeeding S. Charp)
TC5 D.A. Wilson (NZ)
TC6 K. Rahko (SF) (succeeding J. Ekberg)
L.R. Hunt (NZ) (succeeding P. Cooke)
TC8 A.-G. Wang (PRC)
TC9 K. Thoresen (N) (succeeding E. Barca)

ADDRESS (and other) CHANGES
GA Member from Australia (and president)
Mr. Ashley W. Goldsworthy
Managing Director
Jennings Industries Limited
690 Springleave Road
Mulgrave, Victoria 3170, Australia
tel. 61 (3) 566 8888.
telex AA 31532
eables JENNINGS CO
fax. 61 (3) 566 8189

GA Member from U.S.A. (and vice-president)
Mr. George Glaser
tele50-3105119

GA Member from Spain
Prof. Angel Alvarez Rodriguez
tel. 34 (1) 4299108
tele50 23670 uprnad e (c/o Facultad de Informacion.)
42608 usef e
fax. 34 (1) 455 0413

Honorary Member
Dr. Richard I. Tanaka
President
Lundy Electronics and Systems, Inc.
1 Robert Lane
Glen Head, NY 11545, U.S.A.
tel. 1 (516) 671 9000
telex 650 2541 6767
fax. 1 (516) 671 9412

SEARCC
c/o National Computer Board
NCB Building
71 Science Park Drive
Singapore 05 11, Singapore

NEW IFIP PUBLICATIONS*
CONFERENCE PROCEEDINGS
Program Specifications and Transformation
Proc. of the IFIP TC2 Working Conf.
Bad Tolz , F.R. Germany, Apr 86
L.G.L.T Meertens, Ed.
Microcomputers in Secondary Education
Procs. of the IFIP TC3 Regional Conf.
Tokyo, Aug 86
S. Morigui, Ohtsuki, T. Furugori, Eds.
Computer-Aided Techniques in Manufacturing, Funengineering and Management
Proc. of the IFIP TC5 Seminar
Beijing, Apr 87
Q.S. Sun, A. Rostadts, Eds.
special issue of Computers in Industry, vol. 8, nrs. 2 & 3, 1987
Information Network and Data Communications, I
Proc. of the IFIP TC6 International Conf.
Ronneby Brunn, Sweden, May 86
D. Khakhar, Ed.
Office Systems: Methods and Tools
Proc. of the IFIP WG4.4 Working Conf.
Pisa, Oct 86
Bachi , D. Tschirizis, Eds.
Stochastic Modelling and Filtering f
Lecture Notes in Control and Information Sciences, vol 91
Proc. of the IFIP WG7.1 Working Conf.
Rome, 84
A. Germani, Ed.
Advanced Programming Environments
Lecture Notes in Computer Science, vol. 244
Proc. of the IFIP WG2.4 Workshop
Trondheim, Norway, Jun 86

IFIP ANTHOLOGY
Computer and International Socio-Economic Problems
H. Sackman, Ed.

JOURNALS
Computers in Industry, The International Journal of IFIP TC5
six issues per year
four issues per year

FUTURE IFIP MEETINGS
GENERAL ASSEMBLY AND COUNCIL (and related meetings)
GA
1-6 Sep 87
Budapest
29 Feb-4 Mar 88
 Auckland, New Zealand
5-9 Sep 88
New Delhi
last week Aug 89
San Francisco

TECHNICAL COMMITTEE AND WORKING GROUP MEETINGS*
WG2.2
July 87
Sophia-Antipolis, France
WG3.5
July 87
Lausanne
WG5.1
July 87
Gent, Belgium
TC5
13 June 88
Dresden
TC6
11-12 Sep 87
Harare, Zimbabwe ?
TC7
Sep 87
Tokyo
TC9
27-28 Jun 87
Amsterdam
TC 10
2 Jun 87
Rochester, NY, U.S.A.
WG 10.5
3 Aug 87
Vancouver ?
TG11
Oct 87
near Vienna

* Some meetings are scheduled in conjunction with Working Conferences, for which the conference dates are listed.

IMIA
General Meeting
17-18 Oct 87
Buenos Aires

CHANGES IN IFIP
SEARCC representative
Mr. Robert lau
Institute of Systems Science
National University of Singapore
Heng Mui Keng Terrace
Kent Ridge
Singapore 0511, Singapore
tel. 65 7722094
telex ns 3998
fax. 7782571
VLDB Foundation Representative
Dr. Bubenko
Syslab
Dept. of Information Processing and Comp. Sci.
University of Stockholm
S-106 91 Stockholm, Sweden
Publications Officer
Dr. Karen Duncan
tele50-3105119

CALLS FOR PAPERS
TC6 and TCB Symposium on Network Information Processing Systems
9-13 May 88, Sofia, Bulgaria
papers due: 1 Oct 87
contact: Prof. K. Boyanov
Bulgarian Academy of Sciences
Center of Informatics and Computer Technology
acad. G. Bonchev str., bl. 8
1113 Sofia, Bulgaria
WG6.2 Conference on Information Resource Management
3-5 May 88, Noordwijkerhout, The Netherlands
papers due: 15 Sep 87
contact: Prof. Henk G. Sol
Information Systems Group
Delft University of Technology
P.O. Box 356
2600 AJ Delft, The Netherlands
WG5.3 7th Conference on Software for Discrete Manufacturing—PROLAMAT 88
4-17 Jun 88, Dresden, G.D.R.
papers due: 15 Sep 87
contact: Prof. Koehan
Technische Universität Dresden
Sektion Fertigungstechnik and Werkzeugmaschinen
PROLAMAT 88
Mommsenstrasse 13
Dresden, Dem. Rep. of Germany 0827
tele 463 3339
telex 022 78
TC3 Symposium ECCE '88—European Conference on Computers in Education
24-29 Jul 88, Lausanne, Switzerland
papers due: 30 Oct 87
contact: ECCE 1988
Prof. Bernard Levrat
Centre Universitaire d'Informatique
1 rue du Lac
12000 Chrysler Drive
Park, MI 48288-1118, U.S.A.
Papers due: 30 Oct 87
contact: EECE 1988
Prof. Bernard Levrat
Centre Universitaire d'Informatique
1 rue du Lac
12000 Chrysler Drive
Park, MI 48288-1118, U.S.A.
Papers due: 30 Oct 87
### CALENDAR OF EVENTS

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
<th>Organized by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop on CAD Engines</td>
<td>8-9 Jun 87</td>
<td>Tokyo, Japan</td>
<td>TC10/WG 10.5</td>
</tr>
<tr>
<td>Third Intl. Conf. on Data Communication Systems and their Performance</td>
<td>22-25 Jun 87</td>
<td>Rio de Janeiro, Brazil</td>
<td>TC7/TG/WG 7.3</td>
</tr>
<tr>
<td>Work. Conf. on Recent Advances in Communication and Control Theory</td>
<td>23-26 Jun 87</td>
<td>Washington, DC</td>
<td>TC7</td>
</tr>
<tr>
<td>Work. Conf. on Social Implications of Home Interactive Telematics (HIT)</td>
<td>24-27 Jun 87</td>
<td>Amsterdam, Netherlands</td>
<td>TC9/NGI</td>
</tr>
<tr>
<td>Intl. Workshop on LAN Management</td>
<td>2 Jul 87</td>
<td>West Berlin, Germany</td>
<td>TC6/WG 6.4A</td>
</tr>
<tr>
<td>Work. Conf. on Optimal Control of Systems Governed by Partial Differential Equations</td>
<td>6-7 Jul 87</td>
<td>Santiago d.C., Spain</td>
<td>WG7.2/CICYT</td>
</tr>
<tr>
<td>Work. Conf. on the Primary Curriculum and New Technology-Ways and Means</td>
<td>6-9 Jul 87</td>
<td>Gent, Belgium</td>
<td>TC3/WG 3.5</td>
</tr>
<tr>
<td>Workshop on Architecture for Knowledge Engineering</td>
<td>Jul 87</td>
<td>Uxbridge, U.K.</td>
<td>WG10.5</td>
</tr>
<tr>
<td>Workshop on Wafer Scale Integration</td>
<td>Jul 87</td>
<td>Milwaukee, Milwaukee</td>
<td>WG10.5</td>
</tr>
<tr>
<td>Workshop on Information Flow in Automated Manufacturing Systems</td>
<td>7-8 Aug 87</td>
<td>Vancouver, Canada</td>
<td>WG5.7</td>
</tr>
<tr>
<td>Intl. Conf. on Very Large Scale Integration-VLSI ’87</td>
<td>1-10 Aug 87</td>
<td>Winnipeg, Canada</td>
<td>WG5.7/IFAC</td>
</tr>
<tr>
<td>Tbird Intl. Conf. on Advances in Production Management Systems-APMS ’87</td>
<td>12-14 Aug 87</td>
<td>Toronto, Canada</td>
<td>WG8.4</td>
</tr>
<tr>
<td>Workshop on Knowledge Representation, Management and Utilization in the Office</td>
<td>17-19 Aug 87</td>
<td>Tokyo, Japan</td>
<td>TC7/IFORS</td>
</tr>
<tr>
<td>Thirteenth IFIP Conf. on System Modelling and Optimisation</td>
<td>31 Aug-4 Sep 87</td>
<td>Edinburgh, Scotland</td>
<td>WG 10.2</td>
</tr>
<tr>
<td>Intl. Workshop on Hardware Design Verification</td>
<td>Aug 87</td>
<td>Hamburg, Germany</td>
<td>TC9/GIS</td>
</tr>
<tr>
<td>Work. Conf. on Opportunities and Risks of Artificial Intelligence Systems</td>
<td>Aug 87</td>
<td>Stuttgart, Germany</td>
<td>IFIP/INTACT</td>
</tr>
<tr>
<td>Second Intl. Conf. on Human-Computer Interaction-INTERACT 87</td>
<td>1-4 Sep 87</td>
<td>Dubrovnik, Croatia</td>
<td>WGS.3</td>
</tr>
<tr>
<td>Work. Conf. on Diagnostic and Preventive Maint. Strategies in Manufac. Syst.</td>
<td>1-4 Sep 87</td>
<td>Harare, Zimbabwe</td>
<td>TC6/CS/2Z/</td>
</tr>
<tr>
<td>Intl. Conf. A FRICOM ’87-Towards the 21st Century Planning for Information Communication in Developing Countries</td>
<td>8-10 Sep 87</td>
<td>Budapest, Hungary</td>
<td>ARCC/</td>
</tr>
<tr>
<td>Work. Conf. on Governmental and Municipal Information Systems</td>
<td>8-11 Sep 87</td>
<td>Portland, OR, U.S.A.</td>
<td>TCB/3/VNSCS/HCSO/</td>
</tr>
<tr>
<td>Conf. on Functional Programming</td>
<td>14-16 Sep 87</td>
<td>Amsterdam, Netherlands</td>
<td>TCB/2/ACM</td>
</tr>
<tr>
<td>Intl. Conf. on Coping with Computer-Age Vulnerability</td>
<td>28-30 Sep 87</td>
<td>Torino, Italy</td>
<td>TC9/NGI</td>
</tr>
<tr>
<td>Work. Conf. on Computer System Design Methodologies</td>
<td>Sep 87</td>
<td>Paderborn, F.R.G.</td>
<td>WG10.1</td>
</tr>
<tr>
<td>Intl. Workshop on Techniques and Algorithmic Complexity of Simulation</td>
<td>Sep 87</td>
<td>Amsterdam, Netherlands</td>
<td>WG10.2</td>
</tr>
<tr>
<td>Intl. Workshop on Tool Integration and Design Environments</td>
<td>5-7 Oct 87</td>
<td>Boston, USA</td>
<td>WG10.3</td>
</tr>
<tr>
<td>Work. Conf. on Distributed Processing</td>
<td>6-8 Oct 87</td>
<td>Eberbrup, Denmark</td>
<td>TC5/WG5.2</td>
</tr>
<tr>
<td>Workshop on Intelligent CAD</td>
<td>18-20 Oct 87</td>
<td>Vienna, Austria</td>
<td>TC2/DDC</td>
</tr>
<tr>
<td>Workshop on Partial and Mixed Computation</td>
<td>19-21 Oct 87</td>
<td>Tokyo, Japan</td>
<td>WG6.1</td>
</tr>
<tr>
<td>Work. Conf. on Smart Card 2000</td>
<td>21-23 Oct 87</td>
<td>Santa Monica, U.S.A.</td>
<td>WG5.3/IFORS</td>
</tr>
<tr>
<td>Work. Conf. on Software for Factory Automation</td>
<td>Aug 87</td>
<td>Zurich, Switzerland</td>
<td>TC9</td>
</tr>
<tr>
<td>Work. Conf. on Vocational Training for Engineers</td>
<td>Oct 87</td>
<td>Manchester, U.K.</td>
<td>TC6/WG6.4A</td>
</tr>
<tr>
<td>Workshop on Local Area Network Management</td>
<td>16-19 Nov 87</td>
<td>U.K.</td>
<td>TC6/SDF/SSI</td>
</tr>
<tr>
<td>Working Seminar on Information Networks and Data Communications (INDC-87)</td>
<td>Nov 87</td>
<td>Brussels, Belgium</td>
<td>WG10.5</td>
</tr>
<tr>
<td>Workshop on Process and Design for 3D Chips</td>
<td>Nov 87</td>
<td>Brussels, Belgium</td>
<td>TC5/IEE/IFAC</td>
</tr>
<tr>
<td>Symp. on Achieving Safety and Reliability with Computer Systems</td>
<td>Nov 87</td>
<td>Brussels, Belgium</td>
<td>WG7.3/ITC/FRNS</td>
</tr>
<tr>
<td>Conf. on Training for Tomorrow</td>
<td>7-9 Dec 87</td>
<td>Eilat, Israel</td>
<td>TC9/IFAPA</td>
</tr>
<tr>
<td>Intl. Symp. on Computer Performance Modelling, Measurement and Evaluation</td>
<td>13-17 Dec 87</td>
<td>The Netherlands</td>
<td>WG3.3</td>
</tr>
<tr>
<td>PERFORMANCE ’87</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop on Human Factors in CAD</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Large Scale Computation in Science and Engineering</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Geometric Modelling</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Impact of Information Systems in Developing Societies</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Teleteaching ’88</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on People, Society and Computing Landscapes</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop on Concepts and Characteristics of Declerative-Based Environments</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intl. Symp. on Information Systems as a Resource for Management</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Info. Technology Mgt. for Productivity &amp; Strategic Advantage</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Computational Issues in Combinational Optimization</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Artificial Intelligence, Data Bases and Information Systems</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synops on Software for Computer Control-SOCCOCCO ’88</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Parallel Computing: Algorithms, Languages and Architectures</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symp. on Network Management</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Intl. Conf. on Information Resource Management</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Network Information Processing Systems</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifth Intl. Conf. on Computer Security-IFIP/Sec ’88</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop on The Information Systems Research Arena in the Nineties</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Optimization of Stochastic Systems</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intl. Conf. EURINFO 88: Information Technology for Organizational Systems</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eighth Intl. Conf. on Analysis, Design and Evaluation of Man-Machine Systems-MMS ’88</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seventh Intl. Conf. on Software for Manufacturing-PROLAMAT ’88</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Organizational Decision Support Systems</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Computer in Nursing</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on The Role of Artificial Intelligence in Data Bases and Info. Syst.</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Conf. on Computers in Education-ECCE88</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Mathematical Software for Asynchronous Computation</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Knowledge-Based Production Management Systems</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint Conf. on Open Communication Systems for Applications in Office and Manufacturing</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work. Conf. on Management Aspects of Information System Development</td>
<td>87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| IFIP 89 – 11th World Computer Congress | 28 Aug-1 Sep 89 | San Francisco | FIP |