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Topic:

Fundamentals, Free-shear and separated flows, Wall flows, Modelling and simulations, 2D turbulence, Geophysical and astrophysical fluid dynamics, Aeroacoustics, Combustion, Hydro and aeroelasticity, MHD, Compressible and variable-density flows, Industrial flows, Control, Rotating and curved flows, Two-phase cavitating flows.

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Instructions for authors:

Standard Latex article format. Possibility of short communications.
Films should be in format "gif98".

President's Introduction

Greetings and best wishes to all members of EUROMECH and to the readers of Newsletter 15.

2000 will be an election year for the EUROMECH Council. Five new members will have to be elected under the auspices of the Advisory Board (the membership list is on the Internet at <http://www.it.cas.cz/euromech/Structure/advisory.phtml>) who will prepare a list of candidates on whom members will vote in September/October 2000. Suggestions for candidates can be made to any member of the Advisory Board. If you suggest a candidate, please make sure he/she is willing to serve on the Council for six years, and please supply a one page Curriculum Vitae and a complete address.

The final choice of candidates will reflect both the need for some continuity with the remaining Council members and the opportunity to involve new members. It is also important to get a suitable spread over the different countries in Europe and a sufficient representation of the many aspects of solid and fluid mechanics.

Candidates will prepare biographical notes which will be published in the Newsletter before the elections. The new members of the Council will take office on 1 January, 2001.

Since many members of the EUROMECH conference committees come to the end of their term of office at the end of 2000, I take this opportunity to thank all past and present members of EUROMECH bodies for their great commitment to the work of our Society.

Finally I would like to thank all Chairpersons of EUROMECH Colloquia and those who have participated in EUROMECH Colloquia and Conferences in 1999 for the support of EUROMECH.

Hans-Hermann Fernholz
President, EUROMECH

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Post-Doctoral Appointments.

At its meeting in April the EUROMECH Council decided that in the interests both of organisations and post-doctoral workers in mechanics, we should try to run a simple appointments service. If sufficiently minimal we should be able to operate without charging, though this is not an undertaking to continue doing so, and at a later date institutions may be asked to pay.

A 'notice' is intended to open communication, not to give a full description of a post. The purpose is to publicise the existence of the post, and direct potential applicants to the web page of the organisation in question to find the details.

A 'notice' for a post should contain:

The name of the organisation.

The field of work involved - in a minimum of words, as for key words used in indexing a paper.

The type of worker required - e.g. Post-Doctoral worker with experience of PIV

The proposed starting date.

The organisation's web address.

The 'notice' should be sent as text only to the Secretary General at

< ok @bivoj.it.cas.cz >

Notices may be edited before they are posted.

Notices will appear on the Society's web page at

< <http://www.euromech.cz> >.

An Aural History of Euromech (Part 3)

Dr. Fons Alkemade

(Parts 1 & 2 of this article appeared in Newsletters 13 & 14)

Sometimes, positive innovations were made, e.g. at EUROMECH 50 (Berlin, September 1974): "[The] discussions were not only lively and always overran their allotted time, but did arrive at some conclusion. The Chairmen believe that this was helped by distributing to participants a list of questions to be discussed at the Colloquium before their arrival. Having such an agenda enabled the Chairmen of the discussion sessions to control the discussion and to proceed to conclusions without limiting the participants' freedom too much."

It seems that only in April 1975 were *Rules of Procedure for the European Mechanics Committee* adopted:

1. The function of the Committee is to arrange Colloquia on specialized research topics, and such other activities as may be appropriate, within the field of theoretical, experimental and applied mechanics, in Europe.
2. The benefits of European Mechanics Colloquia are intended primarily for research scientists and engineers in the small and medium-sized countries of Europe, they being in special need of mutual support and scientific co-operation.....
8. The Committee will cooperate with other international bodies in the interests of the advancement of knowledge of mechanics.

The Rules were revised in 1991. Rule 3 became: "The meetings arranged by the Council should be characterized by simplicity, international friendship and scientific effectiveness." In 1975, "informality" had been used instead of "simplicity".

Conferences

At the time of printing, five types of EUROMECH conferences take place:

- EUROMECH Turbulence Conferences (ETC)
- EUROMECH Fluid Mechanics Conferences (EFMC)
- EUROMECH Solid Mechanics Conferences (ESMC)

LETTER OF THE TREASURER

Dear EUROMECH member,

Soon you will again receive a Payment Form (individual and joint members) or an Invoice (institutional members) for payment of your EUROMECH membership fees 2000. From this year on we will switch to EUR and the unit membership fees will be 8 EUR. The fees are, therefore, as follows:

Individual member: 24 EUR
Joint member: 16 EUR
Institutional: 48 EUR

All members, except GAMM joint members, will receive the Payment Form which should be returned even if you pay as a joint member through your Affiliated Organization (AFM-AUM, AIMETA, CCEMS, USME, BYELOMECH). GAMM joint members are exceptions because GAMM adheres globally through a specified number of its members.

Note that you can pay by credit card (Visa, Master Eurocard), checks, bank transfers or cash. All payments must, however, arrive free of charge for the recipient. The preferable way of payment is, therefore, by credit card because in this case there are practically no bank charges. We only need to know your credit card number and the expiration date.

You may pay any time without waiting for the Payment Form. In this case just send us an email or a note indicating when and how you paid.

Why do we need your financial support? Most of the work is done by the Officers and Council members on a voluntary basis. There are, however, expenses such as secretarial help, postage, upkeep of data bases, printing etc which can no longer be taken in charge by the different institutions. We also need to give financial help to Council members from Eastern European Countries, support EUROMECH Colloquia and Conferences, give Prizes, produce the Newsletter, etc. The annual budget is presently about 40 000 EUR.

Why become a EUROMECH member? Members may take advantage of benefits such as reduced registration fees at EUROMECH Colloquia and Conferences, reduced subscription rates to the European Journal of Mechanics, information exchange through the Newsletter and the Web on meetings, job offers, and other matters in mechanics. Less tangibly but perhaps even more important, membership provides an opportunity for professional identification and for helping to shape the future of our science in Europe and make mechanics attractive to young people.

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- EUROMECH Nonlinear Dynamics Conferences (ENOC)

- EUROMECH Mechanics of Materials Conferences (EMMC)

The first EUROMECH Conference, on Turbulence, was organized in 1986. Since then six others have been held around Europe. In the March 1990 version of a document titled *Notes on Conferences held by the European Mechanics Council*, we read: "The general purpose [of the Conferences] is to provide opportunities for scientists and engineers from all parts of Europe, East and West, to meet and to discuss current research. ... The fact that the conferences are organized by Europeans primarily for the benefit of Europeans should be kept in mind. Qualified scientists from any country are of course welcome as participants, but the need to improve communications within Europe is relevant to the scientific programme and to the choice of leading speakers.

A conference on a broad subject ... is not a gathering of specialists all having the same research interests, and much of the communication that takes place at a conference is necessarily more in the nature of imparting information than the exchange of the latest ideas. A participant should leave a conference knowing more and understanding more than he/she previously did, and much of that gain may not be directly related to his/her current research."

In September 1991, the first EUROMECH Fluid Mechanics Conference was held, in Cambridge. The total number of registered participants was 368. The largest group, from the UK, accounted for 25 percent of the total while participation from non-European countries was restricted (though not by the organizers) to 20 from the USA and 8 from Canada. 45 Scientists were from Eastern Europe, while no participants came from Denmark, Hungary and Portugal; Italy and The Netherlands were especially well represented.

A total of about 400 abstracts was received. Of these nearly 300 were presented in some form. Twenty-two invitations were issued for principal lectures, and twenty were actually presented. There were 3 mini-symposia, each with 8 papers, and poster sessions with a total of 55 presentations. Professor Crighton reported about this conference: "I am reasonably satisfied with the way things went. Most of the sessions were quite well attended and the overall standard of work presented and presentation of it were quite reasonable. There were certainly some very good presentations, and very few unacceptably poor ones. There were a few papers that certainly should have been rejected by the [Conference Committee], and there were a few papers which I would like to have seen presented but which could not be presented because we were unable to find the authors."

At the time of going to press, reports have not been received for Colloquia 401-405

EUROMECH Colloquium 406

Image processing Methods in Applied Mechanics

Chairmen: T.Kowalewski, W.Kosiński (Warsaw), J Kompenhans (Göttingen)

EUROMECH 406 was held in Warsaw on May 6th - 8th 1999, in the modern conference centre run by the *Barnabie Brothers*. There were 67 participants, three from outside Europe. There were fifty oral presentations introduced by six invited lectures:

- G.M.Carlomagno: *Quantative infrared thermography and convective heat transfer measurements*
- I.Grant: *Image processing problems in fluid mechanics*
- T.Kreis: *Digital holography and holographic interferometry*
- M.Kujawinska: *Phase methods of fringe pattern analysis*
- W.Osten: *Active vision in optical metrology*
- P.Smigielski: *Differential interferometry or "shearography": Use in fluid and solid mechanics. A long story.*

The Colloquium in some degree is a sequel to earlier meetings from 1992 to 1997 (Colloquia 279, 335, 350 and 365). The intention was to create a common platform for fluid and solid groups working on the same subject, development of the modern image acquisition and processing methods. We have the impression that this aim was fulfilled.

Topics discussed included digital holography and interferometry, motion analysis, including several mutations of Particle Image Velocimetry, pattern recognition, size, shape and colour analysis, thermography (infrared, liquid crystals), measurement of species concentration, three-dimensional image analysis, tomography and high speed imaging. There were also a few presentations on image processing problems characteristic of medical problems.

Despite the large variety of subjects and differences in the background of participants, all sessions were very well attended and lively discussion continued until the last moments of the meeting. It appeared to be possible to find a common language for very varied problems in mechanics.

A booklet with the extended abstracts has been prepared *Prace IPPT 4/1999*. Short abstracts and other material may be found on <<http://fluid.ipt.gov.pl/euro406>>.

Impact and Damage Tolerance Modelling of Composite Materials and Structures

Chairmen: C.Soutis, I.Guz (Imperial College, London)

EUROMECH 400 was held in the Department of Aeronautics, Imperial College, London on September 27th – 29th 1999. There were 46 participants who gave 22 presentations.

Fibre reinforced plastics offer an attractive potential for reducing the weight of high performance aerospace structures. However their use is limited by their susceptibility to impact damage in the form of multiple delaminations throughout the thickness. Low energy impacts on aircraft may occur due to dropped tools, hailstones or runway debris. The localised 'barely visible impact damage' (BVID) is potentially a source of mechanical weakness, particularly under compressive loading. Considerable effort has, therefore, been devoted to analysis of the impact properties and post-impact compression behaviour with a view to improving damage tolerance.

The colloquium brought together researchers and practitioners from all over Europe. The aim was to address progress made in recent years in the modelling (analytical and numerical) of impact resistance and damage tolerance of polymeric composite laminates and structures. Damage tolerance is defined as the ability of the composite to 'tolerate' damage, that is to limit further propagation under service loading. The papers focused on the identification and characterisation of the problem from microscale to product; explored ways of tackling and solving the problem by a combination of models, including how to set up the model and its interrogation; and finally its display in a useful form that permits successful application by computer implementation.

Contributions Particularly covered areas in impact resistance of composite materials, modelling of low/high velocity impact, impact induced delamination analysis, bird-strike impact modelling, impact and crashworthiness, energy dissipation and analysis, optimisation of damage tolerance, open hole compression and compression after impact.

Proceedings have been prepared without editorial input from the electronic versions of the manuscripts provided by the authors.

As early as 1981, Batchelor warned the Committee that one day they would have to choose a new Chairman. Professor Leen van Wijngaarden (University of Twente, The Netherlands) reacted to this in a letter to Batchelor of February 1981: "... I have gradually learned and seen that it runs smoothly mainly due to your personal authority with everybody in the field of mechanics. You write that the 'position of Chairman of the EUROMECH Committee carries some standing'. My belief is that 'George Batchelor carries (some) standing'."

Five years later, in December 1986, Batchelor wrote to Crighton that he didn't want to be co-opted again for the Council. "A couple of years ago I felt the time had come for me to withdraw from EUROMECH activities and give way to younger people more in touch with current research."

Batchelor nevertheless remained Chairman of the Fluid Mechanics Conference Committee until the end of 1994.

EUROMECH was founded long before the 'euro'-hype started. However, 'Europe' has become more and more important, also in science. Indirectly, this has led to fundamental changes in the organization of EUROMECH, which today is officially known as *EUROMECH - European Mechanics Society*.

The idea to make a society of EUROMECH was not actually so recent. In May 1978, Batchelor wrote to Professor E. Krause in Aachen: "You also mentioned in your letter that it would be desirable to have a European Mechanics Society and some centralised facilities for activities like the publication of scientific journals. Here the Committee found a number of different views around the table. It is true that in some subjects a society to which individuals can belong has been found useful. But mechanics is a basic science which enters into a number of different fields of application, such as aeronautics, chemical engineering, oceanography, materials science, and a European Mechanics Society would cut across the boundaries of a number of existing national or international subject societies such as the European Geophysical Society."

In the first EUROMECH Newsletter, of August 1992, we read: "Mechanics is a long-established branch of science, with a rich history in the course of which many important developments have occurred in Europe. Mechanics is also a distinctive branch of science, to be distinguished from physics, from mathematics, and from engineering – and it is an outward-looking subject, still in a phase of very strong research development, and with applications and interactions with many other branches of physical, biological and engineering science. Mechanics is important

to all countries in Europe, not least because it is a relatively inexpensive subject in which all European countries can participate at a good scientific level at modest expense, and because of its technological importance for the industries of all European countries. ... The subject of mechanics is not yet represented by ... a Society, and it can be argued that if it is not, it will be spoken for by organizations representing physics, or mathematics, or geophysics, or some branch of engineering science. One consequence of this might be a loss of funding to mechanics, especially in the context of new European funding mechanisms for scientific research and collaboration, but a more serious long-term consequence could be a systematic decline in the perceived importance of mechanics in university education and scientific research programmes generally."

At the February 1992 meeting of the Council it was decided to start the process of transforming EUROMECH into a Society. This process was completed in April 1993, when the Statutes were agreed by the Council. On 1 January 1995 a new Council set to work, following these new Statutes.

Article II starts with: "The objective of the Society is to engage in all activities intended to promote in Europe the development of mechanics as a branch of science and engineering. Mechanics deals with the motion, flow and deformation of matter, be it fluid or solid, under the action of applied forces, and with any associated phenomena. Activities within the field of mechanics range from fundamental research on the behaviour of fluids and solids to applied research in engineering."

A lot has happened since the change into a Society. The Chairman has turned into a President and the Secretary is called Secretary-General. From 1994 the already existing European Journal of Mechanics has been designated "an official medium of publication of EUROMECH-European Mechanics Society".

One of the consequences of the new status of EUROMECH is the phenomenon of members. Three categories exist here: individual members, joint members, and institutional members; they all pay a modest annual fee. Another novelty is the Advisory Board, consisting of the President, up to twelve members appointed by the Affiliated Organizations, and up to twelve members of the Society, appointed by the council. The Board has to "prepare ... a field of candidates for each Council vacancy" and can "bring forward ... matters and issues relating to any topic within the scope of activities of the Society".

EUROMECH Colloquium 398

Fluid-Structure Interaction in Ocean Engineering

Chairmen: E.Kreuzer (Hamburg-Harburg), O.von Estorff

EUROMECH 398 took place in Hamburg on October 11th – 14th 1999. There were 32 participants. There were 23 presentations of 30 minutes including discussion on the following topics:

- Vibrational analysis of ship-like structures with FEM, BEM and coupled FE/BE methods
- Fluid-structure behaviour after impact loading
- Stability and bifurcation analysis of offshore structures and ships
- Nonlinear phenomena of flexible ship-like and offshore structures
- Shape optimisation of floating structures
- Scour at underwater pipelines
- Experimental investigations of the behaviour of fixed and floating offshore structures
- Underwater robot dynamics
- Underwater cable dynamics

Proceedings will not be published but a booklet containing extended abstracts was prepared.

The colloquium brought together scientists from mechanics, physics and mathematics and promoted a vigorous exchange of ideas. The broad spectrum of topics from different areas of science and applications underlines the interest in the field of 'Fluid-Structure interactions'.

A well received excursion was offered on Tuesday October 12th.

EUROMECH 399 was cancelled

EUROMECH Colloquium 397

Impact in Mechanical Systems

Chairmen: B. Brogliato (Grenoble), W. Stronge (Cambridge)

EUROMECH 397 was held in the ENS d'Ingénieurs Electriciens de Grenoble from June 30th to July 2nd 1999. It attracted 54 people from 15 countries of whom 7 were from outside Europe.

The four main topics were: a) Mathematical aspects of nonsmooth mechanics in finite and infinite dimensions b) Dynamic analysis of vibro-impact systems c) Numerical simulations of nonsmooth mechanical systems d) Modelling of impact phenomena.

There were five plenary lectures:

Prof. M. Marques (Lisbon) with Dr. Kunze (Köln) on Moreau's sweeping process.

Prof. Ivanov (Moscow) on vibro-impact systems and their stability.

Prof. W. Stronge (Cambridge) on elasto-plastic models in multibody impacts.

Prof. Hurmuzlu () on multiple impacts with a solution based on energetic restitution.

Dr. Abadie (Schneider Electric) on kinematic trains with particular emphasis on circuit breakers.

These lectures will be published in the series *Lecture Notes in Physics* (Springer).

The participants showed a high level of interest and most of the 34 25 minute oral sessions were very lively. The topic of multiple impacts, which may constitute one of the major challenges in impact dynamics, was discussed by several members through the Newton's cradle example. Numerical analysis also figured in many talks, which witnesses the importance of reliable numerical methods for such systems, requiring the development of specific numerical schemes. Virtual prototyping in industry increasingly relies on such tools and there is little, if any, software available capable of providing reliable and accurate results. Several participants enlivened their talks by presenting little but significant experiments (Newton's cradle, the Pcus Viridis, various impacting 'toys') or videos (granular matter dynamics).

The Colloquium was generally well received, and even included two members from Systems and Control, and one Historian of Science who discussed the later treatment of Descartes' views on impacts.

The present and the future: An interview with Professor David Crighton

At the time of writing the President of EUROMECH was Professor David G. Crighton [Now succeeded by Professor H.H. Fernholz]. It is no accident that his room is only a few metres from Professor Batchelor's room in the DAMTP building. But one soon notices that Professor Crighton is quite a different person from his predecessor as he is nowadays. He is a busy man, involved in many scientific and organizational affairs [and was recently elected to be Master of Jesus College, Cambridge]. His travelling schedule is vast and complex and his secretaries can hardly follow his whereabouts.

But Professor Crighton is also a very kind man. He puts a large part of his heart (and time) in EUROMECH and he is *the* person to tell about the present and future of the Society.

"My first contact with EUROMECH was my participation in EUROMECH 4 in Southampton. That was already a quite largish meeting, very different in style from what you had heard about EUROMECH 1 and 2, with a small group of people sitting around a table.

I came onto what was called the EUROMECH Committee in April 1984. I was invited in 1983 to organize a Colloquium (EUROMECH 188) and this was used as a test... I didn't pass this test immediately. The IUTAM Observer on the Committee had a lot of questions that he asked before he was satisfied and I had to submit a revised proposal. The kind of concern that applied then, and still applies now, was that a person in a given field puts up a proposal and he uses words which are his ordinary words and then he has a certain expectation of what kind of people will want to come. But someone from a different field may say: 'Ah, but we use these terms also'. So you get several completely different communities trying to attend the meeting. If you don't avoid that, it will be a disaster. And the observer was right, undoubtedly. This was a good experience because it taught me that there was something serious in EUROMECH and they tried to avoid meetings between people whose fields did not really overlap and who couldn't properly understand each other.

The first meeting of the Committee I attended was in the Technical University of Berlin, where we had this extraordinary procedure: I saw then how the Committee went in great detail through the proposals for Colloquia. That was the main activity. We also spent some time looking through the reports of the previous years to see if we could learn anything and we noted that some countries dropped out of

participation and others became very strong. I think all new members of the Committee, seeing the agenda, would not understand how even one afternoon would be necessary to do the job. But they would soon learn long days were necessary..."

Since then a lot has changed within EUROMECH, but the nature of Colloquia has hardly changed. "We now have almost reached EUROMECH 400. We want to reach all parts of Europe... Some places we haven't reached yet of course. I have been trying for years to have a Colloquium in Iceland and I do have contact with an applied physicist there. A topic like the mechanics of geothermal energy extraction might attract a lot of people."

"We need to retain the informal, spontaneous character but we should also respect, wherever possible, the need that some people have for a greater time ahead in organizing a Colloquium. Some Colloquia have become quite formal, but some always were. Sometimes there are proceedings and sometimes these are even available when you register, which is not what we want. But on the whole I think people still try to run fairly lively, informal meetings. In the instructions for the Chairman we ask them to leave the deadline as late as possible and to give people the maximum opportunity for discussion."

The changes which have taken place in Europe during the last few years have had a large impact on EUROMECH. "The participation of Eastern European countries is developing rather well in some ways. Russia is already the largest Eastern participant in the Colloquia. Ten years ago, if we had 16 Colloquia in a year, there might have been five or six Soviet scientists altogether. The participation from other countries, however, has decreased very dramatically: Poland, Hungary (particularly disappointing), Bulgaria. The Czechs on the other hand are very strong and active. The reason for the weak participation of some countries is partly money. Another explanation might be that Eastern Europeans can join GAMM (the Gesellschaft für Angewandte Mathematik und Mechanik) at reduced rates and become members of EUROMECH indirectly."

"It is strange that we had much better contacts with the Bulgarians and others during the Cold War than we have now. But there are also countries in the West which are not so strong as they could be. Spain traditionally doesn't have the strength in mechanics that goes with its size. There are very good people in Spain but we haven't had enough collaboration. Some years ago we had only very few members in France, but after a national mechanics society there had organized a big drive, we got some 120 new French members."

EUROMECH Colloquium 396

Vortical Structures in Rotating and Stratified Fields

Chairmen: R. Verzicco (Roma-Bar) and G.J.F. van Heijst (Eindhoven)

EUROMECH 396 took place in Cortona (Italy) on June 22nd - 25th 1999 in the "Palazzone", a beautiful 16th century building owned by the Scuola Normale Superiore di Pisa. The location and organization of the meeting was the same as for EUROMECH 305 "Vortex Dynamics", organised by P. Orlandi and E.J. Hopfinger, to which this colloquium is a successor. There were 60 participants from more than 13 countries. The meeting was organised in 8 sessions, with 5 invited 40 minute lectures given by C. Cambon, G. Carnevale, D. Edling, J. Fernando and P. Orlandi. There were 42 20min. oral presentations and 8 posters accompanied by a 5 min. talk. The quality of all presentations was generally high and the programme was arranged in such a way that enough time was left for discussion. Indeed, the exchange of argument was in many cases so lively that in most sessions the discussion had to be continued during coffee breaks or lunches. The subject matter was divided into geophysical vortices, wave/vortex interactions, topographic effects and interaction with boundaries, mixing and dispersion, and effects of rotation and stratification on shear flows and turbulence.

Thanks to the friendly and informal atmosphere this Colloquium succeeded in bringing together scientists and engineers active in the field with the aim of discussing recent developments in key problems of geophysical fluid dynamics and industrial applications. The general feeling was that the meeting was successful, it being a congenial blend of science, food and wine in pleasant surroundings.

EUROMECH Colloquium 394

Theory and Numerics of Anisotropic Materials at Finite Strains

Chairmen: K.Hackl, C.Celigoj (Graz), C.Miehe (Stuttgart)

The colloquium took place on March 29th – 31st 1999 at the Technical University, Graz. There were 43 participants from nine countries who presented 28 contributions.

The presentations were in general concerned with the development of constitutive laws and numerical algorithms for large scale anisotropy as well as the simulation of specific materials. A broad range of different types of materials and effects as well as theoretical and numerical approaches and ideas was covered.

Topics covered in the meeting included mathematical, physical and thermodynamic foundations for different anisotropic material laws, such as hyperelasticity, plasticity and viscoplasticity with isotropic and kinematic hardening and damage, or granular and other materials with microstructure. Phenomena considered include localization, texture development, phase transitions and memory effects. Many contributions introduced new numerical algorithms and models for problems such as crystal-plasticity, damage mechanics or anisotropic plates and shells. Finally there were presentations dealing with parameter-identification from experimental data, the relation between microscopic and macroscopic properties of materials and approaches using homogenization techniques.

The meeting was characterised by lively discussions. The organizers believe that it has provided an overview of the recent progress made in the field considered. Many new results were presented which will have a significant impact on the future development of the field.

The proceedings of the Colloquium are planned to appear as a special issue of the *International Journal of Solids and Structures*.

No report for Colloquium 395 had been received at the time of going to press

The present aim of the Society is to have at least 2000 members. At this moment there are just over one thousand [1200] and the number is rising slowly but steadily. "There are three groups of people which we will try to reach. We are thinking of student-memberships at reduced rates. Then there is an organization in which most people working in magnetohydrodynamics are united. It is affiliated to IUTAM, but it can't be affiliated to EUROMECH because it can't actually deliver members to us; it is not a national society. But nevertheless we obviously want to have some interaction with them otherwise we shall never see MHID in EUROMECH. And the third category is industrial companies. We hope to be able to persuade them that it is valuable to support EUROMECH so that they will provide some money."

One of the ways to attract new members is by having a special link with a scientific journal. "When we first talked about the founding of the Society somebody quickly asked whether we shouldn't have our own journal like other societies. But we also quickly decided that we shouldn't make yet another journal – there are too many anyhow – but it was obviously wise to have a close connection with a European journal. Ultimately we would like to see a situation in which in the members of EUROMECH automatically get one of the European Journals of Mechanics at a much reduced rate. [This is now the case – see the back of the Newsletter] At this moment the European Journal of Mechanics publishes announcements of EUROMECH activities and in fact they have offered much more space."

The big question, of course, is why EUROMECH has been turned into a society. "It is six years now since we discussed this change. I think it started at a regular Committee meeting in Stuttgart in 1991, late at night after a long day of looking at proposals. It had arisen from a concern about mechanics becoming threatened. But once we started to think about that, we realized that if we tried to do something about that, there would be strong positive things, not just negative things. In particular, we could try other things that EUROMECH was not doing. If we founded a society, we could also do things on a much bigger scale. We could try to influence funding for example in Brussels and even try to influence national curricula with regard to the position of mechanics."

Naturally, the people behind the society idea were aware of the existence of somewhat similar institutions, like the International Union of Theoretical and Applied Mechanics. "IUTAM is a very different organization in that it is a society of representatives of national bodies. In some countries the situation is very complicated for representing mechanics. In France for example, there are eleven or so mechanics societies and three big ones. IUTAM is a society of societies, rather

than a society of independent scientists. And we thought that the whole principle of EUROMECH had always been to do with individuals."

As we have seen above, Professor Batchelor was not so much in favour of a society. "His concerns, and I think that they are justified in some way, are that once you form a society you have a lot of formal business that doesn't immediately help the main activity. You are restricted in what you can do, by rules and by voting and things like that. Other considerations of things outside science become important. The whole issue is how to moderate those difficulties while still trying to preserve the spirit of EUROMECH: the informal meetings and the encouragement of young people."

However one of the problems the Society is meeting today is that these young people hardly get a chance to become actively involved in EUROMECH. "We have got into the situation where the Council is increasingly composed of senior figures. People tend to vote for well-known people instead of young people. We should now try to get lots more young people involved in EUROMECH, people who have the energy and time. One of the problems, also, about the elections is that if the members elect a certain number of senior people, none of these senior people want to do the jobs of Secretary-General or Treasurer because they already have plenty to do. But it is also hard to find young people who want to spend two days per week or so on EUROMECH. There is a lot to do, I am sure. We are very conscious of the fact that we are not doing as many new things as we should.

IUTAM has managed to make positions like that of Secretary-General an attractive job, even for well-known senior people. Finding people gets more difficult because the amount of paperwork in everybody's department has increased enormously. A few years ago I could do the first EUROMECH Newsletters - quite long ones - myself, but that is impossible now."

"My task as President, and that of the other Officers, has become rather different from what it has been historically. We are still (in March, 1997) in a period of transition. The Chairman of the Committee and the Secretary used to share a lot of the work, e.g. correspondence with the Chairmen of Colloquia. Now the position of President is changing to one similar to that you have in IUTAM where the President is supposed to really think about the development of the society and worry less about writing letters. We are not in that situation yet."

One of the early achievements of the young Society has been the establishment of new conference series. "In 1993 we had the first Nonlinear Oscillations Conference and in 1996 we had the first Mechanics of Materials Conference. And probably we will have another new conference line starting shortly. I think the

contributions were devoted to physical modelling applications and regulatory purposes.

The scope and topics of the Colloquium, and the fact that both completed studies and work in progress were included, produced lively and extended debate among the participants that will surely lead to new research and collaboration. The setting and ambience of the host institute, the smooth organisation and informal atmosphere, and the dinner on the first evening all furthered these ends.

EUROMECH Colloquium 392

Mechanics of Railway Interfaces

Chairman: R.A.Smith

EUROMECH 392 took place in Sheffield on March 25th - 27th, 1999, attended by 28 participants of whom 5 came from outside Europe. There were 16 presentations, the topics being:

- The wheel/rail contact 7
- Aerodynamics 3
- Crashworthiness 2
- Dynamics 2
- Noise and vibration 2

Although contributions were invited on the interactions between the train and current collecting devices, none were forthcoming. Likewise there were no contributions on the mechanics of pollutant dispersal. The wheel/rail contact provided nearly half the programme.

The small numbers attending the meeting, and the residential nature of the arrangements, led to active and informal discussions which were much enjoyed by the attendees. Several of the authors are preparing papers for the I.Mech.E's Journal of Rail and Rapid Transport. All delegates expressed their pleasure at the arrangements and the technical usefulness of the meeting.

EUROMECH Colloquium 391

Windtunnel Modelling of Dispersion in Environmental Flows

Chairmen: Z. Jaňour (Prague), A. Robins (Guildford)
and M. Schatzmann (Hamburg)

EUROMECH 391 took place at the institute of Thermomechanics, Academy of Sciences, the Czech Republic in Prague on September 13th – 15th, 1999. There were 41 participants with 9 coming from outside Europe. There were 31 presentations, supported by a collection of extended abstracts.

The objective of the Colloquium was to bring together the community involved in the laboratory simulation of flow and dispersion in the atmospheric boundary layer. The scientific programme focused on:

- flow and dispersion around buildings and structures (excluding wind loading),
- flow and dispersion over complex terrain,
- techniques and equipment used in their simulation,
- means by which such simulations are tested and evaluated.

Four new windtunnels for atmospheric boundary layer simulation and a number of new experimental techniques were described, including a review of the simulation of chemical transformations.

Many contributions were devoted to flow and dispersion around buildings and structures, particularly in the urban environment. New results and data sets for evaluating computational models were presented, covering various configurations of street-canyon and buildings, including the effects of ambient stratification. Comparisons of different windtunnel measurements were also discussed.

The gas dispersion studies described included the effects of dense gases, stratification and complex terrain, in addition to buildings, and some general conclusions on plume behaviour in these circumstances were put forward. Again, data bases for model evaluation and development were presented.

The issues and difficulties in comparing the results of computational and windtunnel modelling with field data were addressed in some detail. This demonstrated the complications that arose from the wide range of scales of motion that affect dispersion in the field, and showed that the larger scales need to be omitted before comparisons were made. It also showed how data sets that combined field and windtunnel experiments were the most useful for developing and testing computational techniques and providing fundamental insight. Two

general EUROMECH Conferences are reasonably successful; they do draw 400-500 people together. You can compare them with the APS [American Physical Society] conferences in the United States. The more specialized conferences, like the European Turbulence Conference, have already developed their existence and their planning seems to be going pretty well. I think people might be attracted by the fact that these are held regularly and that there is some organization behind them. Otherwise, if you organize a meeting yourself that is not part of anything, you have a lot more problems with advertising etc."

One of the new objectives of EUROMECH, mentioned in Article II of the Statutes, is "the development of standards for education in mechanics and in related sciences". Crighton: "I am sure we could help colleagues if we had an Education Committee that would try to argue why mechanics should be a basic part of education in physics and engineering in Europe and to get some kind of Europe-wide agreement about the minimum amounts of material. That might even have some impact on school curricula. Mechanics in, e.g., British education has been squeezed out, although it is the kind of subject where you can organize lots of project work, for example related to a visit to some amusement park. We could provide information on mechanics in some kind of electronic form (on a CD or the Internet), using media that kids want to use."

The chances of meeting this objective seem to be closely related to improving the image mechanics has 'in Brussels'. "We have to tell politicians and funding organizations that we believe mechanics is a vital part of the economies of all developed countries and in particular of all European economies. It also is a subject that can be studied at the research level relatively cheaply; it is not like particle physics. There is a great tradition in mechanics in Europe. But this long tradition is also the bad side: many people in physics have said for years that the equations in mechanics are known and that it is a boring subject, of interest only perhaps to engineers. The kind of argument that I would make against that is that many of the most spectacular changes in mathematical science in the past century have arisen from fluid and also solid mechanics: solitons, chaos theory, bifurcations, hypercomplex systems, etc. Physicists have just started to understand that mechanics is a very rich field that continues to produce totally new ideas. I think the chances of making these arguments are now quite good because of these good examples. We also know that famous physicists from Heisenberg to the present day have always thought that they could solve the turbulence problem and then found it a very hard problem, harder than the other problems they tried to solve. So I think we have plenty of ammunition. We just need the time to present the arguments, by writing papers and presenting our work to people."

Besides being a fruitful field, mechanics is also getting broader and broader. "My colleague Tim Pedley, who is on the EUROMECH Council, had a meeting the other day to launch a Centre for Biological Mechanics. He thought it would be quite a small thing, but in the event people came from many departments: medical departments, physiology, zoology, biology. And a lot of them were really working on mechanics, even on the mechanics of DNA."

"I am very pleased about the variety of topics treated in the Colloquia. If you look at the topics of the last ten years, you can only be pleased by the range of new subjects that have been brought in. I am in favour of all kinds of fields as long as there is a clear mechanics purpose. We don't go into chemical engineering, but we recently had a Colloquium on smart materials and one on walking machines. If we have some sixteen or eighteen Colloquia a year, that's fine. And the topics are evenly divided, so that for many fields there is Colloquium almost each year. Actually, the biomechanics people rejected the idea of having their own European Conference series; what they wanted was to have informal Colloquia, at least one every year. I think every group of people, should within limits, be allowed to do what they think is reasonable and appropriate to their scientific interests."

Two other objectives which are mentioned in Article II of the Statutes are related to 'networking': "the establishment of links between persons and organizations engaged in scientific work in mechanics and in related sciences" and "the gathering and dissemination of information in mechanics and in related sciences". Crighon: "There is a plan to make a register of mechanicians in Europe and their professional interests, in such a way that anyone who wants to know who is working on combustion for example, can find that. Again this is the kind of thing for which we need much more activity from members because the legislation in different countries about holding personal information in computers is very different. Another service for members of which we are thinking, is making available electronically information about job positions in mechanics."

"So the general scene is mixed. It would be stupid to claim that it was all success. There is a lot to be done. Certainly a society supported by several hundreds of industrial companies would be a powerful body that could influence European education in mechanics for example. We are rather weak compared with other societies, e.g. those in chemistry. The response from the members so far hasn't been very successful. When I write in the Newsletter 'we need your thoughts', I don't get hundreds of letters. But maybe the situation isn't worse than in other subjects."

EUROMECH Colloquium 389

Physiological Flows and Flow-Structure Interactions

Chairmen: K. Perktold, T. Kenner, Graz

EUROMECH 389 took place at the Educational Centre Raiffeisenhof in Graz from April 20th - 24th, 1999, starting with a get-together on the Tuesday evening and dispersing at mid-day on Saturday. There were 96 participants from 20 countries, with a good mix of senior scientists, young researchers and doctoral students with varied backgrounds.

Invited lectures were given by T.J. Pedley (Cambridge, UK), H. Schmid-Schönheim (RWTH, Aachen), R.D. Kamm (MIT) and S. Weinbaum (City College, New York). There were 49 oral presentations and 31 commented posters. The main topics were cardiovascular dynamics, respiratory dynamics, biological mass-transport, cellular mechanics and flow in interstitial spaces and capillaries.

The 84 scientific contributions covered physiological flow and the influence of structure thereon. New developments and perspectives concerning biomechanics and physiology, and the application of the results in clinical medicine were discussed. The presentations predominantly dealt with passive interactions between blood flow and compliant vessels, with little consideration of active flow-structure interactions such as flow-muscle interaction.

The oral presentations were grouped in nine sessions: Flow and stresses in large arteries, vascular graft and stents, blood flow simulation and rheology, blood flow-vessel wall interaction 1, respiratory flow and mechanics, blood flow-vessel wall interaction 2, arterial wall and membrane deformation, biological mass transport, cardiovascular flow and valves, and the circulatory system.

It is hoped to hold another colloquium in this series in two or three years, in another country

No report has been received for Colloquium 390 at the time of going to press