

# THE HISTORY AND DEVELOPMENT OF THE ICEM FROM 1959 TO 2004

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## ABSTRACT

The paper reviews the evolution and development of the International Conference on Experimental Mechanics (ICEM) and its parent organisation, the European Association for Experimental Mechanics (EURASEM), since the first conference in Delft, The Netherlands, forty-five years ago.

## INTRODUCTION

The first conference in the ICEM series took place in Delft, The Netherlands, forty-five years ago in April, 1959. As an outcome of this conference a committee was formed with the task of ensuring that further conferences should be held at four-yearly intervals at a venue to be decided at the end of each conference. So began the conference series which has become the ICEM.

The experimental techniques, supporting technologies, materials available and engineering problems of 1959 were markedly different from those familiar to the stress analysts and engineers of today. The paper provides a review of the changes and developments since the Delft conference, as reflected by the successive conference programmes. It is written with the objective of placing on record the history of this important international event, so as to provide a source of reference for future conference organisers and a commentary on some of the major developments in the field of experimental mechanics over the second half of the 20<sup>th</sup> century.

## ORIGIN AND ORGANISATION

The Stress Analysis Group of the Institute of Physics was established in the UK in 1946 for the purpose of providing a means of sharing information on research and developments in the field of experimental stress analysis and related topics. In 1959, with the help of The Netherlands Organisation for Applied Scientific Research (TNO) and with the active cooperation of organisations in France, Germany (see footnote, Table 1) and Switzerland, the Group organised the Delft international conference. Following a discussion amongst the conference organisers, a meeting of national representatives was convened in Düsseldorf by Professor H. Fessler, UK, for the purpose of confirming the venue for the next conference and setting up an organising body for the conference series. A further meeting was held during the Paris conference in 1962 and at the next conference (Berlin, 1966) a formal constitution document was agreed for the Permanent Committee for Stress Analysis (PCSA), comprising representatives from twelve European countries and Israel (see Table 1).

The *modus operandi* was that the PCSA should choose the venue for the four-yearly conference. The appropriate body in the host country then took on responsibility for all aspects of the conference including publicity, organisation, selection of papers and publishing of the proceedings volume. The Chairman of the organising body became the Chairman of the PCSA with the responsibility of confirming and maintaining membership of the Permanent Committee, communicating with members and convening the next PCSA meeting at the

Table 1 EURASEM\* member countries (1998)

Austria (1986)**	Ireland (1994)	Roumania (1990)
Belgium	Israel	Spain
Denmark	Italy	Sweden
Estonia (1994)	The Netherlands	Switzerland
France	Norway	UK
Germany***	Poland (1986)	USSR (1990)****
Greece (1982)	Portugal	

\* Originally the PCSA.

\*\* The date of joining for non-founder members is shown in brackets.

\*\*\* Throughout the text, in any context prior to 1990, Germany is used as an abbreviation for the Federal Republic of Germany. After that date it signifies the reunited Germany.

\*\*\*\* The USSR ceased to exist in 1991. The detail is included for completeness.

forthcoming conference. The Permanent Committee could meet between conferences, at the request of the current chairman, for the purpose of offering comments and suggestions to the organisers. It has to be said that, by and large, the working of this scheme has been entirely satisfactory.

Some constitutional changes and innovations have been made over the years. At the 1974 meeting of the PCSA in Udine an “information exchange” with the American Society of Experimental Stress Analysis (SESA) was agreed and that body played a valuable supporting role in the Munich conference (1978) and in all subsequent conferences. Some constitutional changes were made in 1982 at the Haifa meeting but the *modus operandi* was not affected. At the Amsterdam meeting (1986) the objectives and interests of IMEKO (the International Measurement Confederation) were outlined to the Permanent Committee; it was also agreed that the title of the committee should not be changed but that the conference should be known in future as the International Conference on Experimental Mechanics, the ICEM. The Japanese Society of Mechanical Engineers (JSME) was welcomed as co-sponsor of the Copenhagen conference (1990) and has made a greatly appreciated contribution to the conferences since then. Also at the 1990 PCSA meeting, it was agreed that the committee name should be changed to the European Permanent Committee for Experimental Mechanics (EPCEM).

Most recently, proposals for a new constitution, prepared by a EPCEM Working Group, were debated at length at the Oxford meeting of the committee in 1998. The proposals were eventually approved with agreed amendments. From the date of the revised constitution (August 1998), in which the objectives of the committee and the responsibilities of its chairman were clarified, the EPCEM became known as the European Association for Experimental Mechanics (EURASEM). The conference title and the basic *modus operandi* remained unchanged.

## CONFERENCE SERIES

The dates and venues of the succession of conferences which followed the Delft conference are given in Table 2, together with the number of papers included in the programme and the number of registered attendees where this information is available. Comments on the individual conferences follow.

Table 2 The Conference Series

Date	Venue	Papers	Delegates
1959 (April)	Delft, The Netherlands	51	
1962	Paris, France		
1966	Berlin, Germany		
1970 (6-10 April)	Cambridge, UK	42	334
1974 (27-31 May)	Udine, Italy	54	261
1978 (18-22 Sept)	Munich, Germany	136	
1982 (23-27 Aug)	Haifa, Israel	57	131
1986 (12-16 May)	Amsterdam, The Netherlands	68	135 *
1990 (20-24 Aug)	Copenhagen, Denmark	236	262 **
1994 (18-22 Jul)	Lisbon, Portugal	241	271
1998 (24-28 Aug)	Oxford, UK	219	380 (approx)
2004 (29 Aug – 2 Sept)	Bari, Italy		

\* This figure includes 45 joint registrants for the concurrent IMEKO conference.

\*\* With an additional 40 “accompanying persons”.

### 1959, Delft, The Netherlands

The conference programme included 51 papers. No proceedings volume was published at the time but in 1961 a publication [1] appeared containing 18 of the presented papers, with summaries in the three conference languages (English, French and German), and English résumés of the remaining 33.

The papers described new techniques, improvements in existing techniques and instrumentation developments for stress / strain determination, and applications across a broad range of problems in civil engineering (foundations, wind studies, cooling towers), mechanical / railway / marine engineering (pipework, vibration analysis, weldments) and material behaviour (fatigue, compressive stress / strain studies). The predominating topics were (i) photoelasticity (in 11 of the papers) and (ii) strain gauge applications and developments (17 papers). There were three papers on innovations in slip-ring design and three on uses of and improvements in the brittle coating technique. Several novel strain / displacement measuring techniques were described. One paper reviewed new moiré applications and one surveyed the possible use of magnetic tape for measurement recording.

In appraising the range of techniques and applications in these 51 papers it has to be remembered that (i) lasers were not generally available until the early 1960s, consequently the wide range of coherent optics techniques in use today did not exist, (ii) moiré interferometry had not been developed and (iii) the “computer age” had not yet arrived. Recognising this state of affairs, one must admire the versatility and ingenuity of the 1950s experimentalists and the quality of their work.

Authors from 10 different European countries contributed to the success of the conference (see Table 3), and although 75% of the 51 papers came from France, Germany and The Netherlands, the conference was admirably effective, as a beginning, in meeting the objectives of the organisers to promote that spirit of interaction and cooperation across national boundaries which is so important a feature of technological progress.

Table 3 Delft papers : countries of origin

Country	Full Text	Résumé
Belgium	-	2
Denmark	-	1
France	3	6
Germany	6	10
The Netherlands	4	9

Country	Full Text	Résumé
Poland	-	1
Roumania	-	1
Switzerland	-	1
UK	4	2
USSR	1	-

### 1962, Paris, France

No information is available on the Paris conference. Writing in 1968 [2], Professor M.L.Meyer (Editor of the proceedings of the Cambridge conference in 1970) noted that “no proceedings were published but stencilled reprints were obtained by members attending”.

### 1966, Berlin, Germany

at the time of writing little information on the Berlin conference has been found. However, Professor Meyer [2] noted that proceedings of the conference were published as VDI Bericht No. 102, “Experimentelle Spannungsanalyse” [3].

### 1970, Cambridge, UK

The technical sessions were held in the Chemical Laboratory Lecture Theatre, Cambridge University, and accommodation was provided in two nearby colleges. There was an exhibition of equipment and instrumentation in the University Engineering Laboratories. Technical visits to local companies were organised and a special “Ladies Programme” included visits to some “stately homes” and a sightseeing / shopping trip to London. The conference fee was £20 (30 euro) and delegates were provided with pre-prints of the papers before the conference.

The conference proceedings, published in 1971 by the Institution of Mechanical Engineers and edited by Professor M.L.Meyer, were a model of completeness, with the full texts of the 42 papers (including discussion contributions and authors’ replies), details of an informal session on The Teaching of Experimental Stress Analysis, a list of the 334 delegates, an author index and subject indices in the three conference languages, English, French and German. (Simultaneous translation facilities were provided in the lecture theatre.) The proceedings volume (576 pages) could be purchased separately at a price of £9 (13.5 euro).

As at Delft in 1959, photoelastic analysis (17 papers) and electrical resistance strain gauge work (10 papers) featured prominently in the papers presented. Model studies using, for example, polythene, rubber or micro-concrete were also described. Two papers dealt with brittle coatings and three were devoted to applications of various moiré techniques. Holographic interferometry featured in just two papers and, additionally, its potential was mentioned in one of the three papers from the USSR. Rather surprisingly only one paper dealt with the assessment of residual stresses. Noteworthy amongst the papers on advanced techniques was that by H. Aben on magnetophotoelasticity, the start of an impressive series. A particularly interesting paper from Belgium described the use of several different techniques (including numerical (FE) work) in three civil engineering design studies.

The conference attracted papers from 17 countries, a considerable increase relative to the Delft conference. The “catchment area” had expanded both to the east and to the west with 11 papers from Eastern Europe (including 3 from the USSR) and 5 from the USA and Canada. There was one paper from Australia but none from the Far East. Not all PCSA member countries were represented (eg. there were no papers from Israel, Italy or Spain, and only one from the Scandinavian countries) but the international status of the conference was now clearly established.

### **1974, Udine, Italy**

The fifth conference took place at the Instituto Tecnico Malignani in the delightful city of Udine, close to Venice and Trieste in north-eastern Italy. The format followed that of the previous conference in Cambridge with pre-prints for delegates, an exhibition, simultaneous translation facilities, a “Round Table” session on “The Teaching of Experimental Stress Analysis in View of Industrial Application” (with contributors from 8 countries), and a Social and Ladies programme with optional visits and tours to places of interest, including a trip to Venice. The organisers had also arranged that the maximum day-time temperature should not exceed 25°C! A bound volume of conference proceedings [5], complete with discussion contributions, authors’ replies and a full list of delegates, was distributed after the conference. Concurrently in Udine there was a IMEKO discussion meeting on “Recent Developments in Force Measuring Devices” for which joint registration was possible. Particularly memorable were the resourcefulness of the organisers in coping with the consequences of a nation-wide strike, the hospitality of the civic authorities and supporting organisations, and the opportunity to see the gorgeous work of Tiepolo and other masters in the city galleries.

The 54 papers were presented in 19 consecutive sessions through the four-day conference period. Needless to say, photoelasticity and strain gauge applications again featured prominently but there was clear evidence of important technological changes with 8 papers on finite element work and 4 on applications of holographic interferometry. Sessions were devoted to brittle fracture and crack propagation and to composite materials, and, most significantly, Stress Analysis in Biomechanics appeared as a major heading which covered stress studies in the human body, the mechanical behaviour of joints, and fracture and crack propagation in bones, using experimental and numerical techniques. The conference also included interesting papers on dynamic stress studies but there was little (one paper each) on moiré applications and residual stresses.

The papers originated from 16 countries. There were 12 from the USA and Canada, and 10 from Eastern Europe including 2 from the USSR and 5 from the CSSR. Papers from India and Japan were particularly noteworthy.

### **1978, Munich, Germany**

The author was not able to attend this conference and therefore cannot draw on any personal experience. His information has been obtained from a report prepared by a member of the Organising Committee and from the conference pre-prints volume [6] published by VDI-Verlag GmbH, Düsseldorf.

The conference was organised by the VDI/VDE-Gesellschaft Mess- und Regelungstechnik with the cooperation of the American SESA; it was in fact a combination of the 6<sup>th</sup> International Conference on Experimental Stress Analysis and the official major autumn meeting of SESA. Immediately striking (Table 2) is the very considerable increase in the number of papers presented. A quarter of the papers

(36) were from the USA and it is evident that the collaboration with SESA had been most successful (“very close, effective and pleasant”, to quote the report). Only slightly fewer papers (31) came from the host country. Altogether there were authors from 24 countries including India (7), USSR (4), Japan (2), Hong Kong (1) and Kuwait (1). With so many papers two parallel sessions proved to be essential.

About 25% of the papers involved photoelasticity but, perhaps surprisingly, there were fewer papers with a finite element content than in the Udine programme. Biomechanics, a major topic at Udine, was represented by just two papers. By contrast, there were about 20 papers on holographic interferometry and speckle techniques, and a good group of papers on residual stress evaluation. Moiré work was also well represented. There were useful papers on fracture mechanics and an interesting early paper on thermoelastic stress analysis.

### **1982, Haifa, Israel**

Haifa is a beautiful city, the third largest in Israel, on hills overlooking the Eastern Mediterranean (the “jewel of Mount Carmel”); it proved to be an excellent venue. The conference was held in the Technion – the Israel Institute of Technology – and papers were presented in two parallel sessions which came together occasionally as a single joint session. No one appeared to be inconvenienced by the absence of simultaneous translation facilities. There was an exhibition of equipment and instrumentation, and a nearby swimming pool for relaxation when the temperature peaked. The Mayor of Haifa provided a civic reception for delegates. The hosts succeeded in all respects in making the conference memorable and enjoyable, and delegates were grateful for the opportunity to savour something of the present and past of this fascinating corner of the world.

The proceedings volume [7] contained 57 papers, some, unfortunately, only in summary form. (Not all the papers listed in the programme were included. The following comments relate to the contents of the proceedings volume.) There were authors from 18 countries, principal contributors being USA (10), Germany (9), France (7), UK (7) and Israel (5). The only Eastern European countries represented were Poland (3), Roumania (1) and Yugoslavia (1), but the organisers would no doubt have been pleased to have papers from Argentina (2), India (2) and Taiwan (2). There was also a paper from Ireland, not, at that time, a PCSA member.

Photoelasticity remained a major topic with papers describing novel applications and technical innovations, including the use of digital image analysis procedures, but there were only three papers with a significant numerical content in the form of finite element analysis. Biomechanics had returned as a substantial theme with seven papers on a range of relevant topics. Optical methods (including holographic interferometry, speckle analysis and caustics studies) and moiré work were well represented; there was a particularly useful paper on moiré interferometry by Professor Dan Post. Residual stress studies included two contributions on the accuracy of the hole-drilling method. The fracture mechanics topic was well covered and there were several interesting papers on composite materials. A paper on thermoelastic stress analysis, a topic introduced in Munich, described the prototype of what was to become a major innovation in applied stress analysis.

### **1986, Amsterdam, The Netherlands**

The eighth conference had the theme “Current Developments and Perspectives in Experimental Mechanics”. It was held in a large Congress Centre in Amsterdam under the auspices of the TNO (The Netherlands Organisation for Applied Scientific Research), concurrently with an IMEKO conference on “Measurement of Force and Mass”; joint registration for the two conferences was possible. Although there were delegates from 21 different countries, the attendance figure (Table 2) was lower than expected, possibly as a result of a nearly coincident international conference on photoelasticity in Japan. Delegates enjoyed the attractions of Amsterdam and greatly appreciated the Civic Reception organised for them. There were visits to the tulip fields and to Delft, organised by the wife of the Conference Chairman, which were also most enjoyable.

A soft-back proceedings volume [8], containing 68 papers, was available to delegates. Foremost amongst the countries of origin were Germany (12 papers), the USA (10), and the UK (9). There were 16 papers from Eastern Europe, including 5 from the CSSR and 4 each from Poland and Roumania, but none from the Far East or Australasia. The papers were presented in English, the conference language, in single session sequence, with joint opening and closing sessions for the PCSA and IMEKO conferences. Poster sessions held in the “lounge” area of the centre on the mornings of the second and third days of the conference proved to be a successful innovation.

The titles of the 19 sessions provide an indication of the principal topics covered. Three sessions were devoted to “Grating techniques”, covering mainly moiré work but with papers also on holographic interferometry and the method of caustics. (Another paper on caustics appeared in a “Various subjects” session.) Two sessions were given to “Photoelasticity” and one to “Strain gauges and instrumentation”. Also, as a clear sign of a major development in the field, a session of 5 papers (4 from the UK) was devoted to “Thermoelasticity”. All 4 papers in the “Fracture mechanics” session originated in the USA. Topics included in the three sessions on “Analysis of various problems” included a study of adhesively bonded trusses and the collision resistance of inland LPG carriers. There appeared to be no work on residual stresses and there was only one biomechanics paper (on the forces in the human body during a jumping take-off). There was a significant finite element content in 6 papers and, notably, an account of the use of the boundary element method, applied in conjunction with experimental work.

### **1990, Copenhagen, Denmark**

The conference was held at the Technical University of Denmark in Lyngby, about 10km from the centre of Copenhagen; some accommodation was also available at the University. Co-sponsors included the IMEKO Technical Committee for Experimental Mechanics, the Japanese Society for Mechanical Engineers (JSME) and the USA Society for Experimental Mechanics (SEM, previously the SESA). Major innovations introduced at this conference were the involvement of the JSME and the provision of a Young Researchers’ Scheme, funded by the Cowi Foundation, which made available financial support for young researchers to attend the conference. Technical visits were organised and non-technical events included a City Hall reception and a classical jazz concert. The author recalls with great pleasure the charms of Copenhagen. The conference was an unqualified success, thanks to the prodigious efforts of Professor Vagn Askegaard and his Organising Committee.

The delegates pack included five volumes of conference proceedings [9]! The authors of the 236 papers came from 28 different countries; there were 45 papers from

Japan alone. Other major contributors were USA (23), Germany (22) and Denmark (20); there were also papers from China (9), the USSR (7), Taiwan (4), Korea (3) and Australia (2). The papers were presented in three parallel sessions in adjacent lecture halls in the conference building and, as in Amsterdam, all presentations were in English, the conference language. In all there were 35 separate sessions and three plenary sessions. This was a remarkable gathering.

In their diversity and range of coverage the papers offered “something for everybody”. There were three full sessions (17 papers) on Experimental Contact Mechanics, 4 sessions on Composite Systems, 4 on Structural Testing, 4 on Material Testing and 3 on Cementitious Materials and Concrete; these groups of papers might well be seen as mini-conferences in themselves. Grid Methods, Holography, Speckle and Laser Interferometry, and Photoelasticity covered 2 sessions each and 1½ sessions (8 papers) were given to Thermoelastic Stress Analysis. Particularly impressive were the 4 sessions (28 papers) on New Developments in Residual Stress Measuring Techniques. Only 2 papers (both in the Contact Mechanics group) dealt with biomechanics. Finite element analysis appeared in a complementary role in 9 papers and the boundary integral approach was used in only one. Papers on the current status of experimental mechanics in (i) China and (ii) Japan in the closing Plenary Session attracted much attention.

### **1994, Lisbon, Portugal**

The conference took place in the conference centre of the Laboratório Nacional de Engenharia Civil when, coincidentally, Lisbon was the European Capital of Culture. The sponsorship list included several national and municipal bodies as well as IMEKO, JSME and SEM. The non-technical attractions of the city and its surroundings were wonderful. There were 271 delegates; they will long remember the Cocktail Reception at the Castelo de S Jorge (“Sunset over the City”), with superb views over Lisbon and the Tagus, and the Conference Dinner in the Casino at the famous coastal resort of Estoril.

The conference proceedings [10] were produced in two handsome hard-back volumes. The list of authors showed 37 countries, with papers from each continent around the globe. Quite remarkably, 61 of the papers (i.e. 25%) were from Japan. (In one subject area, Fracture Mechanics and Fatigue, 23 of the 44 papers (i.e. 52%) were from Japan.) The contribution of this country to the success of this conference (and preceding conferences in the series) has been most valuable. Other impressive figures were: France 25, Portugal (the host country) 21, UK 18, Roumania 16, Germany 15, Peoples’ Republic of China 10 and Ukraine 9. The papers were presented in two parallel sessions and presentation and discussion time was rationed to 15 minutes per paper. There were plenary and poster sessions. All papers and presentations were in the conference language, English.

In the presentation programme and the proceedings volume the papers were grouped under nine headings or “themes”,

- (i) Hybrid techniques in stress analysis (14 papers),
- (ii) Optical techniques in experimental mechanics (71),
- (iii) Automatic data acquisition and processing (8),
- (iv) Transient phenomena and vibration analysis (29),
- (v) Residual stresses (22),
- (vi) Measurement of stresses and strains in hostile environments (7),
- (vii) Quality control and testing of materials and components (39),
- (viii) Fracture mechanics and fatigue (44), and



(ix) Biomechanics (7).

Each theme covered a broad range of applications and developments, and here, as in Copenhagen, the largest groups (e.g. Optical techniques and Fracture mechanics and fatigue) could well have made successful conferences by themselves. It is quite impossible to do justice to this wealth of papers in the space available; however, two are mentioned as an indication of the diversity of topics in the experimental mechanics field: (i) “Impact mechanics of bat and ball” (of direct appeal to cricket enthusiasts) and (ii) “Aeroelastic characteristics of dragonfly wings” (for the technically minded naturalist).

### **1998, Oxford, UK**

The venue for the 1998 conference was the Experimental Psychology Building, Oxford University. Accommodation was provided nearby in Keble College. The conference was organised by the British Society for Strain Measurement (BSSM) on behalf of EPCEM, and enjoyed generous sponsorship from a number of industrial organisations, principally AEA Technology plc, and the co-sponsorship of professional bodies in several countries including JSME and SEM, and of IMEKO. The AEA Technology sponsorship was used to provide awards to help young participants from EPCEM member countries. Oxford (“that sweet city with her dreaming spires” and the oldest seat of learning in the UK) is a place of glorious buildings and tranquil gardens, an unparalleled attraction to academics and non-academics alike. There was an exhibition of measuring equipment etc. in the conference building and the Social Programme of visits and non-technical events proved to be very popular.

There were 219 papers in the conference proceedings, about 25% from UK authors and rather more from Japan. Altogether 27 countries participated. Presentations were made in three parallel sessions, with a typical presentation time of 20 minutes. Plenary lectures on (i) the crashworthiness of trains, (ii) aeroengine materials, (iii) electronic moiré and (iv) joints of the skeleton were very well received.

There were 65 presentation sessions in all; one was devoted to a Young Stress Analyst competition, the rest were grouped under four main headings: (i) Applications of experimental mechanics, (ii) Experimental methods, (iii) Biomechanical engineering aspects of experimental mechanics and (iv) Materials behaviour and testing. As a reminder of the far-reaching changes in technology since the first conference in 1959, it is noted that there were two sessions (10 papers) on photoelasticity (almost all on technical developments rather than applications) and six sessions (28 papers) on other advanced optical techniques (eg. holography, speckle pattern interferometry). Other prominent subject areas were: Fracture mechanics and related topics (5 sessions, 23 papers), Fatigue (4 sessions, 15 papers), Biomechanical engineering (3 sessions, 12 papers) and Residual stresses (2 sessions, 10 papers). A session entitled “Education”, followed by an open discussion session, was a valuable inclusion.

### **2004, Bari, Italy**

At the meeting of EPCEM at Oxford in 1990 the committee had approved the change of name to EURASEM and had agreed that the 12<sup>th</sup> conference should be held in Vienna in 2002, with Professor H. P. Rossmanith as chairman. Unfortunately, and to great disappointment, this intention could not be fulfilled. Instead, the conference was moved back to 2004 with Italy as the host country. As a consequence, delegates now find themselves in Bari, in the care of Professor Pappalettere and his colleagues.

No one doubts that both the technical contents of the conference and the hospitality provided by the organisers will be of the very highest quality, that the standing and reputation of the conference series will be upheld, and that its continuation will be ensured.

### **Acknowledgements**

The author is grateful to Professor H. Fessler for his recollections of the early days of the conference series.

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ICEM 12 – 12<sup>th</sup> International Conference on Experimental Mechanics  
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### **The History and Development of the ICEM from 1959 to 2004**

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The body currently responsible for the ICEM series is the European Association for Experimental Mechanics (EURASEM). The Association comprises representatives from appropriate national organisations from the countries listed in Table 1 (the year of joining of non-founder members is shown in brackets). The organising body began as the Permanent Committee for Stress Analysis (PCSA) and the original constitution dates from 1966. This body became the European Permanent Committee for Experimental Mechanics (EPCEM) in 1990 and EURASEM in 1998. The constitution of EURASEM ensures that the conference is presented at four-yearly intervals at a venue agreed by EURASEM. The conference chairman becomes the chairman of EURASEM, with responsibility for the continuation of the series.

The Bari conference is the 12<sup>th</sup> in the series. Previous venues with dates, number of papers presented and number of delegates (where known) are given in Table 2.

Details of the conference proceedings volumes are given at the end of this Abstract.

The ICEM is widely recognised as the major European event for the dissemination of expertise and information in field of stress analysis and related topics. It attracts authors and delegates from all over the world, and the EURASEM constitution ensures that it will continue to do so.