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WIND ENGINEERING SOCIETY Newsletter

❖ Ramblings

As incoming editor for the WES Newsletter it is my pleasure to thank the outgoing editor, Paul Freathy, for all his hard work in producing the newsletter over the last four years. Having just found a copy of the very first newsletter produced by Paul in 1997, I note that Paul's first reaction was that he couldn't quite believe that he had volunteered to take over editing the newsletter. I must confess to feeling a certain amount of apprehension having just volunteered to take over from Paul!

Elsewhere in these pages you will find a request for abstracts of papers you may have just published for inclusion in the newsletter, together with a request for feedback from the Strategy Committee on the future development of WES, and the services that it should be offering to its members. This newsletter also forms part of those services, but in order to make it successful it needs your support in the form of articles, news items, etc. All contributions will be gratefully welcomed.

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❖ Snippets

➢ EMLEY MOOR ITV MAST LISTED. The 900ft Emley Moor ITV mast in the Yorkshire Pennines was recently listed by English Heritage. The mast replaced one which collapsed during a storm in March 1969. Also listed were London's BT Tower, better known as the Post Office Tower, and the County Police Communication Tower in Durham.

➢ BUILDING SYSTEM WITHSTANDS IMPACTS AT OVER 100MPH. A new protective building system designed to reduce the impact of man-made or natural disasters has been developed by Barrier Construction Systems of Colorado and recently tested at the Missile Impact Facility at Colorado State University`s Department of Civil Engineering. Colorado State professors of civil engineering Bogusz Bienkiewicz, director of the Wind Engineering and Fluids Laboratory, and Wayne Charlie, director of the Center for Geo-Explosive Research, developed the Missile Impact Facility, which is capable of releasing a 15-pound standardized tornado missile at speeds in excess of 100 mph. This capability allowed for testing of tornado missile resistance of wall and roof systems for tornado shelters as specified by the national performance criteria developed by the Federal Emergency Management Agency (FEMA). Testing of the BCS construction system at the Missile Impact Facility showed that the system was capable of withstanding impacts of more than 100 mph, thus providing a versatile solution to protect against missiles and debris resulting from man-made or natural disasters.

➢ ICE VIRTUAL LIBRARY: PAPERS FROM 1936 – 1995. For the past year the ICE has been working on a new service - the virtual library. This is a collection of all the technical papers (excluding conferences and Geotechnique) the Institution has ever published - since 1836 - available to download in full over the web. Phase

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1 of the project is now complete, with papers published between 1936 and 1995 available to view. Papers from 1996-1998 will be on-line in the next month, and 1836-1934 by the end of the year (though there are some 19th century papers up already). The virtual library gives the ICE the largest and most comprehensive on-line full text collection of civil engineering papers in the world (approx 200,000 pages), and is a major achievement for the Institution. It was made possible thanks to a bequest from a long term member. The site is live now and papers will cost £15 for non-members, members will pay £5. Please visit www.iceknowledge.com to view the site.

- WIND-POWERED BUILDING DESIGN IS REVEALED. Buildings with integrated wind turbines could generate at least 20 percent of their own energy needs, and perhaps all. They would be more power efficient than ordinary wind farms or solar powered constructions, say UK researchers. A team of aerodynamics engineers at the Rutherford Appleton Laboratory`s Energy Research Unit, Oxfordshire, UK, has come up with a design for a multi-tower office building or block of flats with wind turbines fitted in between. Curved towers would funnel wind towards the turbines and improve efficiency, they say. Preliminary testing on an seven-metre prototype indicates that the design could be twice as efficient as a stand-alone wind power generator, despite the fact that it does not move to face the wind. Wind speeds in urban areas are typically about two thirds of those in rural areas, so the extra efficiency is vital, says the team.

- ASCE URGES SUPPORT FOR FEDERAL RESEARCH INTO WIND HAZARDS. Congress needs to provide significant research funding to help reduce the significant annual toll in casualties and property damage from hurricanes, tornadoes and other violent windstorms explained Dr. Steven McCabe on behalf of ASCE in testimony before the environment, technology and standards subcommittee of the U.S. House of Representatives Science Committee, October 11. "ASCE has long recognized the need for better research into predicting and mitigating the damage from major wind events," said Dr. McCabe. "All 50 states are vulnerable to the hazards of windstorms. In 1998, hurricanes, tornadoes and other wind related storms caused at least 186 fatalities and more than $5.5 billion in damages." Dr. McCabe is chair of the Department of Civil and Environmental Engineering at the University of Kansas. Rep. Vern Ehlers (R-MI), chair of the subcommittee, agreed that increased federal support for research into high-wind storms is critical. "We must invest in research to increase our ability to predict and model severe weather events," Ehlers said. Each year, severe weather claims about 1,500 lives and causes roughly $16 billion in damages. In addition, approximately $2 trillion, or roughly 25 percent of the U.S. Gross Domestic Product is influenced by weather and climate.

❖ Chairman's Column

First of all, I must start with an apology as it has been sometime since you received a newsletter. It is not an indication that the Wind Engineering Society has not been an active society, as we have continued with our planned technical meetings, committee meetings and additional sub-committee meetings to discuss the long-term strategy for the society. However we are dependent on our editor to find time and resources to produce the newsletter and unfortunately this has not been possible recently. I would like to thank Paul Freathy for the excellent job he has done now that he is handing over the role of editor to Craig Miller. I wish Craig well and hope that he will have the support of all the members in producing regular newsletters.

I would like to express my thanks to the members for electing me to the committee and as Chairman for the two years commencing May 2001. I hope I am not a jinx on the society as the past six months is memorable for a number of things having gone wrong. For the smooth and efficient running of the society we are dependent on the support we receive from the Institute of Civil Engineers, in particular for the secretarial support. Soon after I took on the role of Chairman, Liz Marwood, our much valued secretary, resigned from the ICE and was replaced by Debbie Roberts. I never met Debbie as, when we were due to meet at the first committee meeting in September, she was already in the process of leaving the ICE. Dion Dalgety stood in for our meeting in September and since then we have had one other temporary appointment, that of Jessica, but finally at the beginning of November, Eunice Waddell was appointed and we are hopeful that she will settle into the job and support us in the future.

The second difficulty turned out to be only minor in that our Student Conference on 12th September came the day after the events in New York which threatened to disrupt life in central London. However, only one

contributor was unable to attend the Conference and the event proved to be very successful with nine contributions.

The jinx continued on 7th November at the Scruton Lecture. If you work on the basis that only the things that go wrong are memorable, then all those present will remember our 7th Scruton Lecture. Our thanks and congratulations go out to Barry Vickery whose better judgement before the evening was not to use PowerPoint, but he was swayed under pressure from myself and the technician at ICE that the future was PowerPoint. He, like many others, will now think at least twice when you see the consequences of a virtual memory catastrophic error message beamed on to the screen three-quarters of the way through the presentation. However, Barry surfaced above all the difficulties and gave us the views of a very experienced engineer on coping with dynamic response of tall buildings and towers. It was also very encouraging that for the first time we filled to overflowing the lecture theatre at ICE.

I can only hope things will run more smoothly in the future and may virtual memory lapses not afflict you!

Request for abstracts

As a way of keeping abreast of members interest and activities we would like you to consider sending a copy of any publications that you write that we can include extracts from in our newsletters. So for example if you write a paper for a scientific journal we would like to include the abstract in our newsletter. Our motives in asking for this are several in that it will provide us with material for the newsletter, it will inform members of the society what is going on within the UK and it will also provide us with a data base of published material on wind engineering.

The society does award a senior prize for the best paper published by a member and we would like to use the data base we generate to make a more rational assessment of the "best paper". If we can attract sufficient abstract the committee would like to consider increasing the value of the prize to make it more attractive. So to get this started we would appreciate receiving abstracts of any papers that have been published in 2000/2001 as we have not awarded a prize for this period. So don't be shy, let everybody know what you are up to and this will help to promote your own work and broaden the readership of your publications.

Thank you

Roger Hoxey

❖ Committee Report

This is a regular feature that will keep members up to date with the work of the Executive Committee. If you have strong views on these or any related subjects that the Committee should address please let them know.

Report from the Strategy Committee:

Earlier this year WES set up a Strategy Committee under the chairmanship of Paul Freathy to consider the future development of the WES and how it can best serve its members. The other members of the committee are Brian Smith (Past Chairman), Roger Hoxey (current Chairman) and Brian Lee (as Chairman of the Research Committee). The remit is very open and we would greatly welcome any contributions from members to help us prepare a report by the end of this year. After discussion by the Executive Committee this will then be circulated to all members for discussion at next year's AGM.

We have now held two face-to-face meetings and exchanged countless e-mails and, remarkably, there was a fair degree of consensus about the objectives of the Society and particularly about what we should NOT be doing. We are now in the process of identifying how we can achieve those objectives.

Have your say...

One thing that is driving our discussions is the knowledge that to be successful the WES must provide a useful service to its members. The key question we have asked ourselves is "Why would anybody pay to join the WES?". We think we have some answers to that question but we would very much like to have your input as the members who have paid. Tell us what you think the WES does well and what it doesn't. Tell us what you get out of it or what you would like us to do. Be assured that we will take notice of what you say.

To help prompt you, the areas we are looking at include:

- Professional development of members
- Technical meetings and activities
- Design guidance and codes of practice
- Publications
- The appropriate breadth of WES membership
- Relations with other engineering bodies and users of wind engineering
- Relations with government and other public bodies

Please help by contacting one of the Committee members by e-mail or phone.

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❖ Meeting Report: University Day

A small gathering attended University day on 12 September. Although the events of the previous day lead to one of the presenters being unable to attend, a total of nine presentations were made, abstracts for which are presented below. Mr Brian Garvey of the University of Sheffield received the WES Junior prize for the best paper presented on the day.

THE TURBULENCE ABOVE A ROAD SURFACE AND ITS IMPORTANCE IN THE RESUSPENSION OF ROAD DUST - T Huggins, School of Geography, University of Birmingham

The resuspension of road dust remains an undetermined factor in current UK emission inventories. Research currently underway at the University of Birmingham aims to quantify road dust emissions. It is widely accepted that resuspension has a statistical origin associated with the characteristics of the turbulent flow into which particles are being resuspended. As part of the above study a fieldwork campaign has been carried out to examine the turbulence occurring above a road surface. Measurements have been made of the 3D velocity fluctuations in the airflow close to a road surface using high frequency sonic anemometers. Measurements have been taken at a range of heights within the first two meters above the road surface and spectral analysis has been performed. The resulting spectra show a significant departure from the usual -5/4 power law found for measurements made higher in the boundary layer. The importance of these turbulence measurements in relation to the resuspension of road dust will be discussed.

CFD APPLIED TO NATURAL VENTILATION DESIGN - Tong Yang, School of Civil Engineering, University of Nottingham

A number of new techniques have been developed in recent years, to predict natural ventilation effects in buildings as potential tools and guidance for architects and engineers. The primary concern of natural ventilation design is to ensure that purposed-provided openings are sized and sited in order to provide the maximum and minimum flow rates in summer and winter respectively. Computational Fluid Dynamics (CFD) and direct wind tunnel modelling techniques are employed to predict the ventilation rates of a single-zone building with two dominant openings. Ventilation flow rates and pressure coefficients are investigated in two cases, i.e. wind alone and wind & buoyancy combined. Comparisons between the CFD and full-scale experimental results are examined and the results are also compared with theoretical envelope flow models. The analysis is concluded to provide cost-effective and more accurate modelling methods in natural ventilation for design purpose.

AIRFLOW AND SEDIMENT DYNAMICS IN THE VICINITY OF A DRYLAND VALLEY - Brian Garvey, Department of Geography, University of Sheffield

The interaction of airflow and valley topography can have a significant effect on wind strength and, particularly in dryland environments, this may have important implications for aeolian sediment transport potential. In addition, recent wind tunnel studies investigating airflow over valleys incised into arid plateau landscapes have suggested that valley topography may also have an impact on wind direction. This has important implications not only for the total amount of sediment transported by aeolian processes but also for the distribution of sediment in the vicinity of a valley. Sediment distribution patterns can affect sand dune development and soil nutrient and moisture retention. This paper presents the first attempt to quantify the impact of incised valley topography on airflow patterns using measurements from both field and wind-tunnel investigations. Data are presented from wind tunnel measurements using a 1:1000 scale model of a typical 175 m wide and 20 m deep incised valley. Flow measurements included vertical velocity profiles using cross-wire anemometry around and above the valley section combined with Particle Image Velocimetry (PIV) measurements within the recirculation zone in the valley. The extent of flow modification caused by the valley and shown in the wind tunnel measurements is compared to field data collected in the vicinity of the Kuiseb Valley in Namibia. The field data indicate an upwind region of flow acceleration, a minimum in flow velocity in the centre of the valley, flow acceleration towards a maximum at the downwind valley edge and subsequent deceleration towards starting velocities downwind of this edge. The development of a flow separation region at the leading edge of the valley and the range of flow distortion are affected by the incident angle of the approaching wind to the axis of the valley. A conceptual model indicating the potential implications of the findings in the field and wind tunnel for aeolian sediment transport processes in the vicinity of dryland valleys is presented.

CFD FOR WIND FARM OPTIMISATION- Paul Stangroom, School of Civil Engineering, University of Nottingham

As wind power continues to grow in the UK, siting wind turbines where flow velocities are optimal will maximise energy output. Small fluctuations in wind speed over complex topography can correlate to large differences in energy generation. The first part of the research has focused on simulating wind flow over a 3-D cosinusoidal steep hill, and comparing computational results with available experimental results. This research is aims at confirming the ability of CFD to correctly simulate wind flows. Secondly, in partnership with a research group at Texas Tech University, we will be modelling a complex terrain from the US. There are a series of mesas in the midwestern states of the US that are ideal for wind turbines. The mesas and canyons can have as much as an 800 feet elevation gain in 1/4-1/2 mile. We will be using the latest CFD technology to simulate various atmospheric conditions, such as neutral, stably stratified, and unstable flow. Researchers in the US will model the same terrain area in an atmospheric boundary layer wind tunnel. This final part of the research will look at modelling wind turbines and farms to examine wake effects and their interactions, and to incorporate these models into that of a complex terrain.

POD/ARMA RECONSTRUCTION OF THE SURFACE PRESSURE FIELD AROUND A LOW RISE STRUCTURE - S Kho, School of Civil Engineering, University of Birmingham

This paper investigates the use of the Proper Orthogonal Decomposition (POD) method together with the Autoregressive Moving Average (ARMA) models as a new analysis tool to simulate wind fluctuations. POD has been recently used as a tool in the wind engineering field to describe fluctuating surface pressure field around structures while ARMA model is a well known technique to model time series. This innovative effort to practise the two methods conjunctionally is named as POD/ARMA analysis in this paper. Results of such an analysis on fluctuating pressure coefficients on the full-scale experimental Silsoe Structures Building (SSB) is presented. POD is first applied on the wind fluctuations field and then the model time functions obtained are modelled using ARMA models. Next, the simulated model time functions of the lower few modes and of all modes are used to reconstruct the wind fluctuations field. The accuracy of the reconstructed time series is compared. The association of modes with physical mechanisms around the structure and the importance of modes at each measurement point are also investigated. The results show that although higher modes (less energetic) may not have a significant contribution to the overall accuracy of reconstituted time series, exclusion of these modes lead to inaccuracy in the leeward wall pressure tapping. This POD/ARMA method has demonstrated a major compression of wind data. By using this POD/ARMA method, large amount of wind data, for example, the wind tunnel tests data can be stored in reasonably small data files.

VALIDATION OF THE FLUX FRAME METHOD – D C Welch, Silsoe Research Institute

As the most abundant alkaline gas in the atmosphere, ammonia plays an important role in environmental modification through acidification and eutrophication of land. Livestock production is known to be the major source of ammonia emissions in the UK. As public awareness of animal welfare issues has increased, there has been a move towards extensive pig production, resulting in one quarter of the pig-breeding herd being kept outdoors. Consequently, there has been a shift in the source of ammonia emissions from buildings to fields. Our long-term aim is to quantify ammonia emissions from free-range sows using a flux frame method. However, before this could be achieved confidently, validation experiments were undertaken with recurved passive ammonia flux (PAF) samplers (Welch *et al*., 2001). These showed a collection efficiency of 95.7% up to an angle of orientation of 80° to the flow direction and up to wind speeds of 7 m s^{-1}. Once this was determined, the flux frame method was then validated. Experiments were performed to determine the sensitivity of the flux frame method to factors including type of source (point, line or area), distance of source from frame and wind speed and direction. A small-scale flux frame was constructed for use in the Atmospheric Flow Laboratory (AFL) (Hoxey *et al*., 1999), where measurements of flux at known ammonia release rates under realistic but highly controlled conditions were made. A full size flux frame (12 x 55 m) supporting 132 PAF samplers was constructed in the field for measurements of known ammonia release rates in the natural environment, where meteorological conditions were measured but uncontrollable. For comparison, the total flux through the frame at the actual meteorological conditions was also modelled using commercial software (ADMS 3.0). Measurements in the AFL have begun and collection efficiencies in the range 37.0 – 67.5% have been measured, however so far the plume has not been centrally located on the frame of samplers and saturation of some of the samplers has occurred. Preliminary results suggest that the full scale flux frame in the field is between 44 - 63% efficient in the capture of ammonia from a

point source, and the modelled results agree to within 16%. This collection efficiency will be improved by the addition of an extra row of samplers at 0.3 m from the ground, which modelling has shown to improve the collection efficiency of the frame in all cases, by between 7 and 30%.

WIND INDUCED FORCES ON CEREAL CROPS - Mark Sterling, School of Civil Engineering, University of Birmingham

Lodging, the wind induced permanent displacement of cereal stems from the vertical, can cut the profitability of a cereal crop drastically through lower yield and reduced grain quality. Widespread lodging occurs on average once every four years, with the summers of 1980, 85, 87, 92 and 97 widely regarded as examples of the most serious lodging seasons in recent years in the UK. It is estimated that the severe lodging in 1992 when 16% of the UK wheat crop lodged cost growers up to £130 million through loss of yield alone. Lodging events themselves have been rarely observed in any scientific way, although the results of these events are of course only too obvious. This is due simply to the unpredictable nature of such events in both spatial and temporal terms and the difficulty of making field measurements in often hostile weather conditions. Thus any analysis of the lodging problem is based on hypotheses of how lodging occurs that have not been fully substantiated. If lodging is to be fully understood then it is necessary to obtain detailed measurements of plant, soil and weather conditions during the lodging process itself. In order to rectify this deficit of knowledge, scientifically examine the phenomenon and further develop the model, a number of field trials are planned over the next few years. In order to control the meteorological conditions a portable wind tunnel has been constructed and placed over specially grown wheat crop. The paper will present initial results from the second year of field trials.

PARTICLE DEPOSITION IN COMPLEX TOPOGRAPHY - S Parker, School of Geography and Environmental Sciences, University of Birmingham

Predicting spatial distribution of particulate pollutant matter is important for emergency sampling following atmospheric releases. This is particularly important after incidents involving radioactive material. There is a shortage of information on the influence of topography on the deposition of such material. A combination of wind tunnel and computational fluid dynamics studies has been carried out to try to identify relationships between topographical characteristics, the resulting flow features and relative enhancement or reduction of deposition. The final objective is to develop relationships that can be incorporated into a GIS based, expert system to guide emergency sampling. Wind tunnel flow and deposition data are presented for a number of idealised two- and three-dimensional topographies at 1:1000 scale. These are compared with results from a combination of CFD flow solutions and stochastic particle tracking. A number of areas of enhanced and reduced deposition are identified.

A NUMERICAL STUDY OF STRATIFIED FLOW - K Pikos, ACME Dept, University of Herefordshire

In the design of energy-efficient ventilation systems, generally efforts are made to de-stratify the flow in order to achieve uniform desired air temperature and reduce the heating load of the building. On the contrary, in the design of the air-conditioning system stratification effects are utilized to reduce the cooling load of the building. Stratification effects can also be used in the design of ventilation systems to achieve better air quality. The heat generated by various activities, equipment and the occupants cause temperature stratification in a building. Stratified layers can act as a trap of pollutants. In enclosure fire problems, spreading of the rising smoke at certain height above the floor is affected by stratification. The present study numerically simulates the buoyancy dominated flow leading to stratification. To model thermal stratification, temperature potential is created across the height of the test model by supplying hot and cold air through inlets at high and low levels respectively. An exhaust duct is located on the right wall. In stratified shear flows the modelling of vertical disturbances is most important in the evolution of turbulence. Three dimensional turbulence κ - ε model is used to predict distribution of air velocity and temperature and turbulent kinetic energy in the test model. Predictions of contaminant distribution are made posterior to the simulation to reveal the hot spots of the proposed configuration. The influence of exhaust location, temperature potential and inlet velocity on stratification was studied. To show the influence of the momentum on stratification, the Richardson number, Ri, criterion is used to investigate the preservation and break up of the stably stratified interface in stratified layers. Furthermore, to show what is the influence of the supplied temperature potential on stratification, the change in the temperature differential is plotted against height for different cases of supplied temperature potential.

❖ Short Report: Scruton Lecture

The 7th Scruton Lecture was presented by Barry Vickery, recently retired from the Boundary Layer Wind Tunnel Laboratory at the University of Western Ontario, Canada, on 7th November, 2001. Barry gave a very entertaining talk on the topic of slender but safe tall structures to a standing room only audience. He also showed remarkable sang froid in dealing with a reluctant PC halfway through his presentation (see the chairman's column for further details). It is hoped to carry a full report of the evening in the next newsletter.

❖ CFD for Wind Engineering

In 1998 the Wind Engineering Society Committee solicited the help of Prof Mike Graham (Imperial College) to undertake a survey of UK users of CFD in the context of Wind Engineering. The outcome was disturbing and, as a result, a 'provocative paper' was subsequently published in ICE's Journal 'Structures & Buildings (Castro & Graham, 'Numerical Wind Engineering - the way ahead?', Proc. Instn Civ. Engrs Structs & Bldgs, 1999, **134**, 275-277). One of the major conclusions was that 'wind-engineering CFD users need to be better educated'.

In January 2000 the European Research Community on Flow, Turbulence and Combustion (ERCOFTAC) published a 94-page volume entitled 'Quality and Trust in Industrial CFD; Best Practice Guidelines' (hereafter, BPG). This was produced with detailed input from a wide variety of academics, industrialists, code vendors and others closely involved with the use of CFD in many disparate industrial sectors and it has been widely welcomed. By its own admission, the guidelines it provides 'offer roughly 20% of the most important general rules of advice that cover roughly 80% of the problems likely to be encountered. . . . . More detailed guidelines and application procedures are needed for the remaining specific problems and to extend the guidelines to more complex flows'.

In view of the various detailed pitfalls that are specific to the use of CFD in Wind Engineering, the WES committee was unanimous in agreeing that an Application Procedure document, supplementing the ERCOFTAC BPG, would be useful for Wind Engineers engaged in CFD activity. It thus wrote to a wide range of Consultancies and other organisations (over 100) in the Spring of 2001 asking whether the production of such a document would be of interest. The aim of an 'Application Procedure for CFD in Wind Engineering' would be to help practising engineers to digest the most relevant parts of the BPG and apply it's recommendations appropriately to their problems, providing additional specific guidance on the particular issues faced in Wind Engineering CFD which are not covered in the BPG.

It is curious that despite the increasing use of CFD in our sector, only a handful even bothered to reply and, of these, only two or three showed any definite interest. An even smaller number (one!) offered any financial help. At the most recent WES committee meeting (September 2001) it was therefore reluctantly agreed that this was an insufficient level of support to justify proceeding.

It is to be hoped, nonetheless, that ERCOFTAC's Best Practice Guidelines will become increasingly used in the Wind Engineering sector. This might be a vain hope since the number of uneducated users appears continually to increase. Any WES member (or anyone else) who would like to suggest other ways in which the educational process can be enhanced is invited to contact the WES committee.

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❖ COST C14 Impacts of Wind and Storm on City Life in the Built Environment

Co-operation in Science and Technology (COST) is an EU funded programme that enables academics and industrialists with common interests to meet to discuss the problems in their particular discipline. One of these COST "actions" is in the field of wind engineering - COST C14 Impacts of wind and storm on city life in the built environment. This action began in September 2000 and is due to last three years. The Management Committee consists of representatives of all countries involved in the action, and is chaired by Prof Claudio Borri of the University of Florence. The activities centre around four working groups, which are considering different aspects of the effect of wind on the built environment. These groups are:

Working Group 1 - Assessment of urban wind problems (urban wind environment and effects on pedestrians, urban pollution dispersion, assessment of damage due to storms)

Working Group 2 - CFD Techniques (prediction of wind flow in urban areas, snow, rain and pollutant trajectories, mean and fluctuating forces on buildings and groups of buildings)

Working Group 3 - Large scale facilities and full scale measurement (full scale measurement of urban

wind and loading on structures, use of large wind tunnels, snow drifting experiments)

Working Group 4 - Analytical and numerical techniques (numerical simulation of wind fields, wind induced ventilation, urban pollutant calculations, dynamic response and fatigue loading)

The output from all these groups are likely to be a series of "state of the art" documents describing current knowledge and practice in the fields under consideration. The Wind Engineering Society is well represented in all the activities of the action. Paul Blackmore (BRE) and Chris Baker (University of Birmingham) are the UK members of the Management Committee, and Chris is also vice chairman of the action and chairman of Working Group 1. The UK working group members are as follows

Working Group 1 - Craig Miller (RMS)

Working Group 2 - Ian Castro (University of Southampton), Philippa Westbury (Building Research Establishment)

Working Group 3 - Roger Hoxey (Silsoe Research Institute), Paul Sims (Building Research Establishment)

Working Group 4 - Vina Kukadia (Building Research Establishment)

In addition to the reports produced by the working groups, another important output will be a series of workshops and conference. The first is due to be held in Nantes in June 2002. Further details will be published in due course. In the meantime if any further information is required please contact one of those named above, or consult the web site on www.costc14.bham.ac.uk

CJB

❖ IAWE News

The IAWE Regional Coordinators met in Eindhoven during 3EACWE in July. Amongst the decisions made at this meeting were the following:

- The next European and African Wind Engineering Conference (4EACWE) will be held in Prague in 2005, with Dr Jiri Naprstek as the Conference Chairman.
- 3EECWE to be held in Kiev in 2002 will be the last East-European Conference on Wind Engineering, and future conferences will be amalgamated with the main European and African conference
- A committee co-ordinated by Dr Adam Goliger of South African was appointed to investigate the possibility of planning a pilot project and a conference/workshop on African soil.
- Finally, Giovanni Solari was re-elected as the Regional Coordinator.

❖ In Memoriam

This summer has seen the passing of two prominent members of the American wind engineering community – Robert Scanlan, who died at home on 27 May, 2001, and Dale Perry, who was killed in a fall from a roof on 18 June, 2001.

Robert Scanlan

Born in Chicago in 1914, Robert Scanlan received undergraduate and graduate degrees in mathematics and physics from the University of Chicago and MIT. During the Second World War he served the country as an aeronautical engineer, becoming the Chief of Aeroelasticity at Republic Aviation in New York. After the war, he worked for the Federal Aviation Administration, followed by a professorship at Rensselaer Polytechnic Institute. His work and research in aeronautics and aeroelasticity led to publication of the book Aircraft Vibration and Flutter, a classic text in the theory of aeroelasticity. He was one of the founders of that then new field.

After a second doctoral degree in mechanics at the Sorbonne, he served at CNRS and ONERA in France, and then returned to the U.S. where he worked for Schlumberger, followed by faculty positions at Case Institute of Technology, Princeton, and Johns Hopkins. In his time at Princeton and Johns Hopkins, he developed his second major career emphasis, wind engineering. His prior experience in aeronautics led to the development of the field of aerodynamics and aeroelasticity of large civil engineering structures, such as high-rise buildings, cooling towers and long-span bridges, work which he continued actively until his death. He quickly rose to be recognized as one of the leaders of wind engineering. His book, Wind Effects on Structures (co-authored with former student Emil Simiu) is widely recognized as a key reference in the field.

For his research, he received numerous awards, prizes and citations from his peers. Among them are the James Croes Medal, the Nathan Newmark Medal, the von Karman Medal and the Wellington Prize of the American Society of Civil Engineers. Methods he pioneered for the analysis of long-span bridges under wind loading are now in common use among researchers and practitioners and around the world. He served in leadership roles on technical committees

of the American Society of Civil Engineers (in which he was an Honorary Member), was a member of the National Academy of Engineering and an elected fellow of The American Academy of Mechanics. He recently served as principal aerodynamic consultant on a number of monumental long-span bridges around the world including the new San Francisco-Oakland Bay Bridge, the Golden Gate Bridge (retrofit), and the Kap Shui Mun Bridge in Hong Kong.

Bob Scanlan served throughout his career as an exemplary scholar, engineer, teacher, adviser, mentor, and role model for dozens of undergraduate and graduate students, and for his colleagues.

via Nick Jones, John Hopkins University

Dale Perry

The Wind Engineering community mourns the loss of Dr Dale Perry. Dr. Perry was R.L. Dockery Professor of Housing and the Homeless in the Department of Architecture, Texas A&M University. He was past president of the American Association for Wind Engineering, when it had it's previous name of the Wind Engineering Research Council (WERC), and made significant contributions throughout the field of wind engineering. He served on various committees of many professional organizations including ASCE, SEI, SBCCI and ICBO. He also served as team leader or member for a number of post-disaster investigations.

Previously, Dr Perry taught at the University of Idaho, Washington State University, Georgia Institute of Technology and the University of California at Berkeley. He served as Director of Research and Engineering for the Metal Building Manufacturers Association. A large number of organizations and companies, including FEMA, NSF and State Farm Insurance, have called on Dr Perry's expertise as a consultant over the years.

He twice received the Distinguished Service Award presented by the National Hurricane Conference. Norris Stubbs, A.P. & Florence Wiley II Professor of Civil Engineering at Texas A&M University, remembers Dr Perry as an excellent teacher and enthusiastic scholar. Dr Perry taught a professional ASCE short course with Kishor Mehta (of Texas Tech University) on the wind load provisions of ASCE 7 and co-authored the most recent guide to ASCE 7-98 with Dr Kishor Mehta.

Dr Mehta remembers a humorous incident demonstrating how Dr Perry always came out ahead. "Once when flying to India, Perry left his presentation slides on the plane. Dorothy Reed was flying on a similar schedule from the U.S. to India the next day and the flight attendant mentioned in passing that somebody had left slides on the plane the previous day. Dorothy was going to the same conference as Dale and took the slides with her. Dale rearranged the slides and made the presentation without a hitch. Only he could be so forgetful and yet recover from it effortlessly."

Dr. Perry was inspecting a roof in Dalton, Georgia, on June 18 when he fell through the roof and died instantly from the fall. He will be remembered for his contributions to wind engineering but also for his cheerfulness and enthusiasm.

from the AAWE newsletter

❖ People News

Paul Freathy, Nick Cook and Wayne Pearce - all active members of the Society - are joining forces to create a new wind engineering consultancy and testing business called Anemos Associates Ltd. They expect to be offering a full-range of services, including wind tunnel testing based at Cranfield University. The new company will begin trading early in the New Year. As a result of this merger Nick and Wayne will be leaving the University of Bristol and both existing consulting businesses will cease, although Nick's software interests will continue to be separate from Anemos. The website for the new company can be found at www.anemos.co.uk

Eric Savory is departing from the University of Surrey, and indeed the UK, to take up a position in the Department of Mechanical Engineering at the University of Western Ontario, Canada in the New Year.

❖ Papers to Appear

The following papers will be published in the Journal of Wind Engineering and Industrial Aerodynamics, Volume 90 (1), 2002:

- Full-scale flow visualization over a low-rise building, *Scott A. Wagaman, Kenneth A. Rainwater, Kishor C. Mehta, R. Heyward Ramsey*
- Discrete Hilbert transformation and its application to estimate the wind speed in Hong Kong, *Zuojin Zhu, Hongxing Yang*
- Separation of the contributions of aerodynamic and structural damping in vibrations of inclined cables , *John H.G. Macdonald*
- The critical Reynolds number for rough-wall boundary layers, *William H. Snyder, Ian P. Castro*

- Dynamic response of structures subjected to tornado loads by FEM, *P.K. Dutta, A.K. Ghosh, B.L. Agarwal*

❖ About WES

The Wind Engineering Society (WES) is an affiliated learned society of the Institution of Civil Engineers, with the objectives of promoting cooperation in the advancement and application of knowledge in all aspects of wind engineering. It aims to attract researchers, engineers, architects and others engaged in the design and operation of structures, vehicles or crops subject to wind forces; or concerned with pollution dispersion and other environmental effects influenced by the wind; or concerned with other problems such as ventilation where the same knowledge is strongly relevant.

Specifically, these objectives require WES to:

- Stimulate research into the field of wind engineering.
- Provide a means of communication for the exchange of information among research workers and practitioners.
- Act as a focus to identify research, development and application needs in wind engineering.
- Promote wind engineering methods and good practice in industry
- Offer advice on wind engineering to interested parties related to both specific problems and long term research objectives.
- Act as a representative body in matters relating to the welfare of wind engineering in the UK and such other countries that request representation through membership of the Society.
- Act as a representative for the wind engineering community in the UK and such other countries that request representation through membership of the Society in relation to the International Association of Wind Engineering and other international bodies.
- In furtherance of the foregoing objectives, but not further or otherwise, to collaborate with other organisations in the pursuit of any object or objects in common.

Executive Committee

The current committee is as follows. Contact details can be obtained either from the WES website or from Eunice Waddell at the ICE.

Chairman	Roger Hoxey
Vice Chairman	Brian Smith
Hon. Sec/Treasurer	John Wills
Chairman, Research Ctte	Brian Lee
Chairman, Strategy Ctte	Paul Freathy
Members	Chris Baker Dick Barnard Gordon Breeze Roger Gawthorpe Craig Miller
Co-opted members	Andrew Allsop Ian Castro
Structures & Building Board representative	Tom Wyatt

ICE Support

Our contact at the Institution for all administrative support is Eunice Waddell. She can be contacted at

Tel: 020-7665-2238
Fax: 020-7799-2238
e-mail: Eunice.Waddell@ice.org.uk

WES website

The official WES website can be found at www.ukwes.bham.ac.uk

❖ Forthcoming WES Meetings

(all held at the ICE unless otherwise stated)

6 February 2002, afternoon meeting

Aerodynamic Stability of Bridges

It is now 20 years since the ICE seminar *Bridge Aerodynamics* introduced the British Design Rules for the Aerodynamic Stability of Bridges. The Rules were subsequently produced as a Highways Agency Standard through BD 49/93. since that time further research and wind tunnel testing has been undertaken and the Rules have been revised and recently published as BD 49/01. This technical meeting will describe the development and background to the revised Rules.

8 May 2002, evening meeting

AGM, followed by Technical Meeting

Effect of Climate Change on Wind in the UK

4-6 September 2002, WES Conference

see separate item below

6 November 2002, evening meeting

Eurocode meeting, title to be confirmed

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❖ 5th UK Conference on Wind Engineering

The 5th UK Conference on Wind Engineering will be held at the University of Nottingham on 4-6 September 2002. Extended abstracts of about 4-pages including any figures are requested by 31 January 2002. Subjects could include, but are not limited to:

- Model tests, desk studies or full-scale measurement
- Computational techniques
- Applied wind forces - static or dynamic
- Response to wind loading - static or dynamic
- Wind environment
- Dispersion
- Meteorological studies
- Risk analysis, probability theories
- New techniques or design procedures
- Codes and standards
- Design applications and case studies

Abstracts should include a brief description of the work, methods, results and conclusions. They should identify why the work would be of interest to others. After review, successful authors will be notified and asked to submit revised abstracts by 30 June 2002.

For more information contact:

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❖ AGD Symposium

The Alan G. Davenport Wind Engineering Group, at the Boundary Layer Wind Tunnel Laboratory, University of Western Ontario, Canada is organising an engineering symposium to honour Alan Davenport for his 40 years of contributions to the field of wind engineering on June 20-22, 2002. Two other recent retirees of the Laboratory, Barry Vickery and Nick Isyumov, will also be honoured at special luncheons during the symposium.

The general outline of events as currently planned is as follows:

Wednesday evening (June 19): Registration and an icebreaker in the Laboratory's new Wet Lab facilities, currently under construction and due to be completed just before the symposium.

Thursday (June 20): Technical sessions with lots of time for discussion, a celebratory lunch, and a banquet for Alan Davenport in the evening

Friday (June 21): Technical sessions with another celebratory lunch, and dinner in the evening with Alan Davenport as speaker.

Saturday (June 22): Bus trip to nearby Stratford (an hour's drive) with non-technical presentations, likely to be held in Stratford, followed by lunch and, for those who wish to attend, the musical "My Fair Lady".

Guest speakers who have agreed to participate include Les Robertson, structural engineer for many of the world's tallest buildings, to talk at the banquet for Alan Davenport; Bill Melbourne, well-known Australian wind engineer, to talk at the lunch for Barry Vickery; and Hal Iyengar, another well-known structural engineer, originally involved with the Sears building in Chicago, to talk at the lunch for Nick Isyumov.

The deadline for abstracts has now passed. Detailed registration information is expected to be available by the end of December. In order to receive this information you must pre-register at the symposium website, which can be found at www.blwtl.uwo.ca

❖ Other Forthcoming Conferences

21-25 May, 2002

3rd Eastern European Conference on Wind Engineering
Kiev, Ukraine

21-23 August, 2002

2nd International Symposium on Advances in Wind and Structures
Pusan, Korea

Website: femlab.kaist.ac.kr/awas02/default.htm

2-5 June, 2003

11th International Conference on Wind Engineering (11th ICWE)
Lubbock, Texas, USA

Website: www.icwe.ttu.edu

2004

5th Bluff Body Aerodynamics Symposium
Ottawa, Canada

❖ Contact Point

Contributions, criticism and praise to:

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