Branch News

North West Branch

Evening Meeting

He stood back from the easel and the cloud of dust slowly cleared like an early morning mist. Gasps of astonishment from the assembled throng were followed by murmurs of 'that's the first time I've ever understood anything that Peter Lord has put on the board'. The date was 22 July 1999, the place BDP Acoustics, Manchester, and the occasion – Peter's final public lecture.

So finished an evening during which Peter had sketched out his time in acoustics, starting from the early days at the Shirley Institute (from where he still maintains an interest in Lycra), to the aluminium years, and finally through his tenure at the infamous Royal College of Advanced Technology, Salford.

Whilst lecturing one day, he dreamt that 'noise control' would become an important factor in modern life and so decided to organize a conference on the subject. A chance meeting with Per Brüel in London led to the latter's attendance (with equipment) at a successful conference and also to two weeks of free lecturing and laboratory work. Salford was on the map!

Thereafter, according to the tale, he immersed himself in many years of intensive travelling, smorgasbord and the occasional teaching or consultancy job. Despite his efforts to upset them, clients continued to provide work with many famous names (ICI, Pilkingtons etc) maintaining long term relationships with the University, to such an extent that the Research Council was alleged to be upset because the University was not asking for enough money. Once this was known, Peter did his best to ensure that they were not troubled on that score again!

It was evident from his talk that Peter felt that this role at Salford had changed over the years, not necessarily for the better, but it was also obvious that he is enjoying his latest career as a nearly professional pastellist. What Edgar Degas thought about acoustics is not known, but one day 'Telephone Box at Deerhurst' may be as well known as 'Absinthe Drinker'. Thanks for the evening.

Dave Logan MIOA

Half-Day Meeting

Some 30 or so delegates met at Salford University on 16 September 1999 to hear the latest developments in European Noise Policy. Two speakers gave a presentation; Martin Joseph of the Department of the Environment, Transport and the Regions and Ian Flindell of ISVR, who is co-chair of the EU Working Group on Noise Indicators.

Martin gave an overview of the situation and explained the UK government's position. He described the background to a proposed new directive, the main contents of which are to be the definition of common indicators for noise throughout EU member states, the adoption of those indicators into member state legislation, noise mapping of urbanised areas and the commencement of an EU noise data bank. He also explained the work objectives of the various Working Groups (WG) that

have been set up to assist in the development of the directive. WG1 is concerned with recommending indicators for outdoor noise. WG2 is looking into the Dose Effects of noise and various noise sources, both singly and in combination, and the effect in terms of annoyance, sleep disturbance and the cognitive function in children. The DETR has commissioned research on several of these aspects. The work of WG3 is to recommend computation and measurement methods for assessment, mapping, planning and abatement of noise. WG4 has been investigating noise mapping, an integral part of which has been a pilot project carried out by Birmingham City Council to map the City. At present the draft directive suggests that urban conurbations in excess of 250,000 population will be required to carry out noise mapping. WG5 is looking into means of abatement, although little progress has been made so far. In addition to the above 5 WGs it is intended to set up a WG to look at the Costs and Benefits of every aspect of the Directive and to look at various research aspects. The work of all WGs is overseen by a Steering Committee with the overall objectives of meeting the WHO guidelines for health and quality of life.

Ian Flindell then spoke in more detail on the work of WG1, noise indicators. The main thrust for the work comes from DGXI, the relevant EU Department, and their vision of harmonised noise indicators throughout member states, harmonised computation methods, harmonised assessment methods, comprehensive noise maps, noise control action plans and target noise levels based on WHO guidelines. Although the original brief for WG1 was to recommend harmonised noise indicators for annoyance, sleep disturbance, complaints and speech interference the group felt that the last two were too complex for a simple indicator and their efforts have concentrated on annoyance and sleep disturbance. They found a bewildering range of existing methodology in use across member states together with limited public understanding.

The current inconsistency between member states made any strategic assessments impossible. The main work of the group is now complete and a report has gone to DGXI with recommendations for a European noise Indicator for use in European reporting, general application and for the management of annoyance and sleep disturbance. The recommended units, L_{EU} and $L_{EU,N}$ for night time alone, are intended to be applied to separate noise sources where there is a combination of sources, and should represent a long term average of incident sound at a height of 4 metres above ground. The L_{EU} is calculated from the daytime $L_{Aeq,12h}$ together with the $L_{Aeq,4h}$ evening period with a +5 dB factor and the $L_{Aeq,8h}$ night period with a +10 dB factor. The $L_{EU,N}$ is represented by the L_{Aeq} for the night period with no additional weighting.

A lively discussion followed touching on key subjects such as road traffic noise being the dominant source for 98% of proposed UK noise mapping and on whether industrial polluters would be required to produce noise maps under the IPPC legislation. Another issue that was of concern was the issue of resources required to carry out local noise mapping and who would bear the cost.

Paul Freeborn FIOA ❖

Hansard

23 November 1999
Night Flights

Mr Colman: To ask the Secretary of State for the Environment, Transport and the Regions if he has reached conclusions on the options for changes to the preferential use of Heathrow's runways at night; and if he will make a statement.

Mr Mullin: On 17 November 1998 the Department of the Environment, Transport and the Regions issued the second of two consultation papers on night restrictions at Heathrow, Gatwick and Stansted airports. It was in two parts. Part 1 was concerned with the night restrictions regime for the three airports, and on 10 June 1999, Official Report, columns 378–80, the then Minister for Transport in London, my hon Friend the Member for Hampstead and Highgate (Ms Jackson), announced the new arrangements which came into effect on 31 October 1999. Part 2 examined options for changes to the preferential use of Heathrow's runways at night. The decisions I am announcing today, are concerned with Part 2 of the consultation paper only.

The current pattern of use of Heathrow's runways has remained unchanged since the 1970s and is largely determined by three operational noise mitigation measures. The first and oldest is the Cranford Agreement, an undertaking given to local residents at a public meeting in July 1952 to avoid easterly take-offs from the northern runway during off-peak periods as far as practicable. Over the years it has come to be applied most of the time during easterly operations, so that easterly take-offs use the northern runway only exceptionally. It is possible that the long standing preference for landing aircraft on the southern runway at night during westerly operations is also a legacy of that Agreement.

The second measure is westerly preference, which was introduced in 1962. This provides for westerly operations to continue where there is a light tail-wind up to 5 knots. While it is normal for aircraft to land and take-off into the wind, it is safe to do so with a light tail-wind when the runway is dry and any cross-wind does not exceed 12 knots. The purpose of the westerly preference is to reduce the number of occasions that departing aircraft need to take-off over the more densely populated areas to the east of the airport where it is not possible to design noise preferential departure routes which avoid heavily populated areas.

The third measure is runway alternation, which was introduced in 1972. It applies during westerly operations only. Westerly landings use one runway from 7.00 am until 3.00 pm and switch to the other runway from 3.00 pm until 11.00 pm. The pattern is reversed each week to achieve a fairer balance. Its purpose is to provide communities east of the airport under the final approach tracks with predictable periods of relief from the noise of landing aircraft. While runway alternation applies to landing aircraft only, it is generally the case that one runway is used for landings and the other for take-offs, but take-offs are not precluded from using the runway assigned for landings. Runway alternation was confined to daytime operations to allow opportunities for maintenance of the runways and associated equipment at night. It was confined to westerly operations in order to continue observance of the Cranford Agreement.

In response to requests from local communities seeking a fairer distribution of aircraft noise at night, the Heathrow Airport Consultative Committee (HACC) and BAA plc, with approval from the then Department of Transport, undertook two trials of runway alternation at night for both westerly and easterly operations in 1996 and 1997. Independent surveys carried out for the HACC to assess local reaction to the trials showed there was a clear level of support in the vicinity of the airport for extending runway alternation into the night period. It was decided to consult more widely before reaching a final decision.

9522 copies of the November 1998 consultation paper were issued and 2803 responses commenting on Part 2 (32 per cent of the total) were received by the closing date. These included responses from the HACC, 2649 individuals, 43 local authorities, councillors and local authority organisations, seven Members of Parliament, 63 environmental and local interest groups and 24 representing airlines, airport and aviation interests. Most respondents were concerned to have the least possible number of night flights overflying their particular areas or asked for a ban on such flights. Most also expressed a general view, either supporting or opposing runway alternation at night or modifying the directional preference. Comparatively few commented on the 10 options outlined in the consultation paper itself. Nine respondents called for the termination of the Cranford Agreement and eight called for its continued operation. However, the Agreement was not among the issues examined in the consultation paper.

843 respondents supported the extension of runway alternation into the night period, including most local authorities, the HACC and aviation industry respondents. The widely held view was that runway alternation at night would be fairer and provide for more predictable periods of relief from the noise of landing aircraft. 51 respondents disagreed because they wished to retain the current arrangements or anticipated that runway alternation at night would lead to an increase in aircraft noise over their area. 86 of the 843 respondents who support runway alternation at night (mainly residents and representative bodies) called for it to apply throughout the night until 7.00 am, while 29 of the 843 (mainly aviation interests) said it should operate until 6.00 am to avoid increasing delays to arriving aircraft. BAA consider that it might be possible for runway alternation to operate throughout the night if the scheme allowed greater discretion to land aircraft on the second runway between 6.00 am and 7.00 am, interspersed with take-offs, to reduce the likelihood of arrival delays accumulating through the morning peak period.

In view of the clear support for extending runway alternation to the night period, which is consistent with the

findings of the earlier HACC surveys, we have decided to open discussions with BAA on its introduction at the earliest practicable opportunity between 11.00 pm and 6.00 am. As with daytime alternation, it will be necessary from time to time for the pattern of alternation to be interrupted to allow for maintenance of the runways and engineering works.

There are real practical difficulties with extending runway alternation to the hour from 6.00 am to 7.00 am. There are usually take-offs scheduled in this hour, so during easterly operations runway alternation is precluded by the Cranford Agreement. It is already established practice during this hour to make use of both runways for landings, interspersed with take-offs, to ensure that there are as few aircraft as possible holding in the stacks awaiting permission to land before daytime runway alternation starts at 7.00 am. BAA, NATS and the airlines are concerned that having only one runway available for landings during this hour may lead to a build up of holding delays before daytime runway alternation starts at 7.00 am which could not be cleared until the afternoon. Such delays could also have knock-on effects beyond UK airspace. We are satisfied that there is a genuine cause for concern here, but it has not been possible to forecast with confidence either the frequency or extent of the delays that might occur. On the other hand, runway alternation during this hour would bring real benefits to people living under the final approach tracks.

We have decided that the only prudent way forward is to undertake a trial of runway alternation during the 6.00 am to 7.00 am hour. The details of the trial will be discussed with BAA, HACC and NATS, but will allow NATS the discretion to make use of the second runway for landings whenever arrival delays building up in the system are expected to give rise to holding delays of a given duration. It is likely that different criteria will need to be examined in order to reach a view on what is practicable. Weather conditions, both locally and encountered en route by long haul aircraft, can contribute to the build-up of arrival delays. For this reason the trial will need to look at the winter and summer seasons and may continue for up to two years.

The responses to the consultation paper on the options for modifying the directional preference at night do not provide a sound basis for reaching a final decision at this stage. Strong views were expressed east and west of the airport, and many respondents called for a complete ban on night flights rather than changes to the direction in which the runways were used. However, there was also a recognition among many of the organisations and representative bodies that the present arrangements are not fair and equitable and could be improved; that view is shared by the Government. We also consider that it makes no sense from a noise amelioration standpoint to increase artificially the number of occasions when early morning arrivals overfly the more heavily populated areas of London by maintaining the 5 knot westerly preference at times when there are few or no take-offs.

We have decided not to take forward the options set out in the consultation paper which would have precluded the introduction of runway alternation at night during easterly operations, and which would have concentrated arrivals noise in areas under the approach track to the southern runway during easterly operations. While these options offered the greatest potential for improvement over the present position in terms of the numbers of people affected, the outcome would not have been fair and equitable. For the same reason we have decided not to take forward the 5 knot easterly preference option, except as part of Proposal B below. Therefore, we will be inviting comments on two proposals. These are:

(a) to suspend westerly preference at night after the last departure (including any delayed departures) until the first departure the next morning, but not later than 6.00 am; this is expected to result in approximately 64 per cent westerly operations and 36 per cent easterly operations over the longer term;

(b) for the same period of the night, to put in place a fixed weekly rotation between westerly and easterly operations by applying a 5 knot preference, subject to overriding weather conditions; this is expected to result in approximately 53 per cent westerly operations and 47 per cent easterly operations over the longer term.

The Government are ready to proceed with either proposal. Full details will be set out in a DETR consultation paper to be issued today. A copy will be placed in the Library of the House. This further consultation will allow respondents to take into account the Government's decision on 10 June 1999 not to ban night flights.

Extract provided by Rupert Taylor FIOA

BSI News

BS EN Publications

BS EN ISO 3822: Acoustics – Laboratory tests on noise emission from appliances and equipment used in water supply installations.

BS EN ISO 3822-1:1999 Method of measurement. Supersedes BS 6864-1:1987.

Updated British Standards

BS 6812: Airborne noise emitted by earth-moving machinery.

BS 6812-3:1991 Method of measurement of exterior noise in dynamic test conditions. Amendment No 1.

British Standards Proposed for Withdrawal

BS 5331:1976 Method of test for measurement of the physical properties of sonic bangs. Obsolete.

British Standards Withdrawn

BS 4813:1972 Method of measuring noise from machine tools excluding testing in anechoic chambers. Obsolete.

BS 6864: Laboratory tests on noise emission from appliances and equipment intended for use in water supply installations.

BS 6864-1:1987 Method for measurement. Superseded by BS EN ISO 3822-1:1999.

New Work Started

BS 5550: Cinematography
BS 5550-7: Production and presentation
BS 5550-7.4: Sound
BS 5550-7.4.2: Motion picture sound levels in studio dubbing theatres, review rooms and indoor theatres – Measurement and control.

Drafts for Public Comment

99/564411 DC ISO 15664 Acoustics – Noise control – Design procedures for open plant.
99/564496 DC ISO 13472-1 Acoustics – Procedure for measuring sound absorption properties of road surfaces in situ – Part 1: Extended surface method.
99/654538 DC EN ISO/TR 4869-4 Acoustics – Hearing protectors – Part 4: Measurement of effective sound pressure levels for level-dependent sound restoration earmuffs.
99/711364 DC EN 13554 Non-destructive testing – Acoustic emissions – General principles.

CEN European Standards

EN 1265:1999 Noise test code for foundry machines and equipment.
EN 10160:1999 Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method).
EN 12549:1999 Acoustics – Noise test code for fastener driving tools – Engineering method.
EN 12786:1999 Safety of machinery – Guidance for the drafting of the vibration clauses of safety standards.

ISO Publications

ISO/IEC 2382: Information Technology – Vocabulary
ISO/IEC 2382-29:1999 Artificial intelligence – Speech recognition and synthesis.
ISO/IEC 2382-34:1999 Artificial intelligence – Neural networks.
The UK does not have access to the appropriate expertise and therefore does not participate in the production of the ISO/IEC 2382 Information technology – Vocabulary series of standards.
The standard will not be implemented as a British Standard but the International Standard will be available through BSI outlets.
ISO 3741:1999 (Edition 3) Acoustics – Determination of sound power levels of noise sources using sound pressure – Precision methods for reverberation rooms.
ISO 7779:1999 (Edition 2) Acoustics – Measurement of airborne noise emitted by information technology and telecommunications equipment.
Will be implemented as BS EN ISO 7779 when agreed by CEN/TC 211.
ISO 12715:1999 Ultrasonic non-destructive testing – Reference blocks and test procedures for the characterisation of contact search unit beam profiles.

This information was announced in September and October 1999 issues of BSI Update, copies of which are kept in the Institute library.

Law Report

Tenants have no legal remedy for noise
House of Lords
Published October 22, 1999
Southwark London Borough Council v Mills and Others
Baxter v Camden London Borough Council (No 2)
Before Lord Slynn of Hadley, Lord Steyn, Lord Hoffman, Lord Clyde and Lord Millett
Judgement October 21, 1999
Where premises had been constructed with inadequate sound insulation, with the result that a tenant was disturbed by ordinary, reasonable activities of neighbouring tenants, the landlord was neither obliged by the covenant for quiet enjoyment to improve the premises by installing sound insulation nor liable for damages in nuisance.

The House of Lords so heard in dismissing appeals:
By Mrs Tracey Tanner and seven others from the Court of Appeal (Lord Justice Schiemann and Lord Justice Mantell: Lord Justice Peter Gibson dissenting) (The Times August 20, 1998; [1999] 2 WLR 409) and
2 By Mrs Yvonne Elizabeth Baxter from the Court of Appeal (Lord Justice Stuart-Smith, Lord Justice Otton and Lord Justice Tuckey) (The Times November 11, 1998; [1999] 2 WLR 566).

In the Southwark case Mrs Tanner and some other tenants in a block of flats built in 1919 complained of the absence of adequate sound insulation in their homes. They commenced arbitration proceedings against their council landlord in accordance with the terms of their tenancy agreement and the arbitration ordered the council to install sound-proofing.

On the council's appeal to the High Court Mr Justice Laddie (The Times March 11, 1998) held that the covenant for quiet enjoyment in their tenancy agreements could extend to disturbance caused by noise and upheld the award, but the Court of Appeal majority reversed the judge's decision.

In the Camden case the tenant of a flat in a Victorian house converted into three dwellings in 1975 without provision of adequate sound insulation commenced proceedings in the county court for damages for breach of her covenant of quiet enjoyment and for nuisance. The judge dismissed the claim and the Court of Appeal upheld his decision.

Mr Kim Lewison, QC and Mr Jan Luba for Mrs Tanner and others; Mr Michael Barnes, QC and Mr Donald Broatch for Southwark.

Mr James Goudie, QC, Mr Zia Nabi and Miss Anya Proops for Ms Baxter; Mr Andrew Arden, QC and Mr Christopher Baker for Camden.

Lord Hoffman said that the tenants in both appeals complained of being able to hear all the sounds made by their neighbours. It was not that their neighbours were unreasonably noisy. The flats had no sound insulation.

The tenants could hear not only the neighbours' televisions and babies crying but their coming and going, their cooking and cleaning, their quarrels and their lovemaking. The lack of privacy caused tension and distress.

Neither tenancy agreement contained any warranty on the part of the landlord that the flat had sound insulation or was in any other way fit to live in. Nor did the law imply any such warranty.

It was true that in each agreement the council agreed to keep the structure in repair, but the appellants did not rely on that covenant and could not do so.

Keeping in repair meant remedying disrepair. The landlord was obliged only to restore the house to its previous good condition. He did not have to make it a better house than it originally was.

In the absence of any modern statutory remedy which covered their complaint, the appellants had attempted to fill the gap by pressing into service two ancient common law actions, the action on the covenant for quiet enjoyment and the action of nuisance.

If the present cases fell squarely within the scope of either of those actions, the appellants had to succeed. But if the question was whether the common law should be developed or extended to cover them, the House had to have regard to the fact that Parliament had dealt extensively with the problem of substandard housing over many years but had so far declined to impose an obligation to install soundproofing in existing dwellings.

No doubt Parliament had regard to the financial burden which that would impose upon local authority and private landlords.

In a field such as housing law, which was very much a matter for the allocation of resources in accordance with democratically determined priorities, the development of the common law had not to get out of step with legislative policy.

The covenant for quiet enjoyment read, in the Southwark case 'The tenant's right to remain in and to enjoy the quiet occupation of the dwelling house shall not be interfered with by the council' and, in the Camden case, 'The council shall not interfere with the tenant's right to quiet enjoyment of the premises...'

Read literally, those words would seem very apt. The flat was not quiet and the tenant was not enjoying it.

But the words could not be read literally. The covenant came from a time when, in a conveyancing context, the words 'quiet enjoyment' had a technical meaning different from what they would today signify to a non-lawyer who was unacquainted with their history.

It was a covenant that the tenant's lawful possession of the land would not be substantially interfered with by the acts of the lessor or those lawfully claiming under him.

In principle, his Lordship could not see why regular excessive noise could not constitute a substantial interference with the ordinary enjoyment of the premises. The fact that the appellants complained of noise was therefore not in itself a reason why their actions should fail.

There was however another feature of the covenant which presented them with a much greater difficulty. It was prospective in its nature. It was a covenant that the tenant's lawful possession will not be interfered with by the landlord. It did not apply to things done before the grant of the tenancy, even though they may have continuing consequences for the tenant.

And the tenant took the property not only in the physical condition in which he found it but also subject to the uses which the parties must have contemplated would be made of the parts retained by the landlord.

If the appellants must reasonably have contemplated that there would be other tenants in neighbouring flats, and if they could not complain of the presence of other tenants as such, then their complaint was solely as to the lack of soundproofing. And that was an inherent structural defect for which the landlord assumed no responsibility.

In Duke of Westminster v Guild ([1985] QB 688, 703) Lord Justice Slade had said: 'The express covenant for quiet enjoyment...cannot...be invoked so as to impose on [the landlords] positive obligations to perform acts of repair which they would not otherwise be under any obligation to perform.'

That principle applied a fortiori to the present appeals. The appellants were attempting to use the covenant for quiet enjoyment to create not an obligation to repair but a more onerous obligation to improve the demised premises.

As to nuisance, the appellants faced an insuperable difficulty. Nuisance involved doing something on adjoining or nearby land which constituted an unreasonable interference with the utility of the plaintiff's land. The primary defendant was the person who caused the nuisance by doing the acts in question.

The nuisance of which the appellants complained was the sounds emanating from their neighbours' flats. But they did not allege the making of these sounds to be a nuisance committed by the other tenants.

Mr Goudie said that if necessary he would contend that it was. However, the normal use of a residential flat could not possibly be a nuisance to the neighbours.

If it were, there would be the absurd position that each, behaving normally and reasonably, was a nuisance to each other. If the neighbours were not committing a nuisance, the councils could not be liable for authorising them to commit one. And there was no other basis for holding the landlords liable.

Lord Slynn and Lord Millett delivered concurring opinions and Lord Steyn and Lord Clyde agreed.

Solicitors: Anthony Gold, Lerman & Muirhead; Miss Lyn Meadows, Southwark. Goldbergs; Ms Alison Lowton, Camden.

The action leading to this judgement was referred to in the Letter to the Editor by Dani Fiumicelli AMIOA in the July/August 1999 issue of Acoustics Bulletin.

Centenary Publication

Librarians of many of the Nominated Bodies of the Engineering Council meet together as a committee to exchange information on developments in their libraries and in the library and information world at large. This Engineering Institutions Librarians' Committee (EILC) is

currently preparing a publication to mark engineering achievement in the twentieth century.

Each librarian has selected one text of particular influence on the development of the relevant discipline over the last hundred or so years.

The IOA's contribution is a section of *The Theory of Sound*, by Lord Rayleigh. The book will be published with a limited circulation in the new year; a copy will be held in the Library, but anyone interested in obtaining a copy (free) for their firm's or their own interest should contact the Librarian, Alison Hill, at the Institute office.

Book Review

Acoustical Signal Processing in the Central Auditory System
J Syka (Editor)
Publisher: Plenum Press 1997

This volume contains a collection of 56 papers based on presentations at a symposium held in Prague Castle on 4–7 September, 1996. It is divided into eight sections. The first is on 'General Aspects', the next four on the structure and function of different regions of the auditory system: 'Cochlear Nuclei', 'Superior Olivary Complex and Lateral Lemniscus', 'Auditory Midbrain' and 'Auditory Forebrain', and the last three on specialised functions: 'Mechanisms of Sound Localisation', 'Processing of Vocalisations and Speech' and 'Plasticity and Pathological Processes'. Taken as a whole the papers represent an excellent review of what was known about the auditory system in 1996.

The papers contain reviews or experimental results by the world's leading experts in auditory research. Consequently this volume is aimed at researchers or advanced students already familiar with the complexities of the auditory system. It will be particularly useful to those who specialise in one aspect of auditory research but who wish to keep up-to-date with advances in other areas.

The book is nicely produced and contains a wealth of information. It will provide a useful addition to the bookshelves of laboratories and libraries around the world.

W A Ainsworth FIOA

I/INCE Report

Technical Assessment of the Effectiveness of Noise Walls: Final Report

Foreword

The International INCE General Assembly on 1994-08-31 approved an initiative to review current knowledge and practice concerning the effectiveness of Noise Walls with the objective of obtaining a review of the technical aspects of the acoustical performance afforded by noise barriers for transportation noise sources. This initiative deals with the important physical phenomena and how

to model them. The study was undertaken with the following objectives:

1. Identify the development of barrier usage and performance during the past few decades.
2. Examine the scientific basis behind noise barriers by listing the physical phenomena affecting their performance. Discuss which phenomena are important and to what extent. Review the use of parallel barriers and the need for absorptive material.
3. Collect the available information regarding the performance afforded by noise barriers separated into three areas of application: road, rail, and ground-based airport operations.
4. Provide information on tolerance/spread of prediction to provide an informed judgement for legislation.
5. Discuss the generic properties of products used in the construction of noise barriers.
6. Identify outstanding issues and direction for future work.

The study started in 1995 April, when members of a Working Party on the Effectiveness of Noise Walls were appointed by the Member Societies of I-INCE. The study was completed in 1997 and published as a draft report in *Noise/News International* in 1998 (Vol. 6, No. 1, pp. 11-36), 1998 March. After review and changes, this report was approved for publication by the International INCE General Assembly on 1998-11-15. Each member of the Working Party which prepared this report represents a different Member Society that supports the International Institute of Noise Control Engineering; in addition, there was a Convenor, Gilles A Daigle. Countries and members of the Working Party as follows:

Australia: Ron Rumble
Belgium: Jean-Pierre Clairbois
Italy: Alessandro Cocchi
Korea: Doo-Hoon Kim
Sweden: Leif Akerlof
United Kingdom: David Hothersall
USA (ASA): Ilene Busch-Vishniac
Austria: Dieter Hohenwarter
France: Jacques Beaumont
Japan (ASJ & INCE/Japan): Kohei Yamamoto
Lithuania: Aleksandras Jagniatinskis
The Netherlands: Hans J A van Leeuwen
USA (INCE/USA): Christopher W Menge

This report was approved for publication by a unanimous vote of the General Assembly at its meeting in Christchurch, New Zealand, on 1998.11.15. The Board concurs with the decision of the General Assembly and the final report is published herewith.

Executive Summary

This initiative of International INCE deals with noise walls – the outdoor barriers erected in parallel with highway and rail lines – and in other areas (such as airport runways), where there is a demand to reduce the noise levels of surface transportation sources. There is worldwide interest in the control of noise by the erection of such barriers. Walls are composed of wood, metal, masonry, earth, and other materials, both opaque and transparent. Most of the walls that have been erected to date completely block the sight lines between vehicles and roadside housing. The cost of installation usually exceeds USD one million per kilometre. In some countries, governmental authorities have authorized the use of highway construction funds for the erection of noise walls. When building a new highway or widening an existing highway, the construction of noise walls is required in some jurisdictions when the predicted noise levels of the road traffic exceed defined governmental guidelines. The key questions are: how valid are the traffic noise predictions, and how effective are the noise walls acoustically after they have been erected? Over the years, a number of analytical studies have facilitated the prediction of the noise reduction afforded by such barriers. It is reported, however, that barriers may not always perform acoustically as well as intended.

The principal objective of this study is to obtain a global view of the effectiveness of noise walls – the outdoor barriers erected in parallel with highway and rail lines, and in other areas (such as airport runways). The report summarizes the scientific basis of noise barriers, including measures of barrier efficiency, the physical phenomena involved (including effects associated with the propagation and effects associated with the noise wall as well as different barrier shapes), and the various models used to predict barrier performance. Different barrier materials are briefly described. The measurement of barrier effectiveness is also discussed. A section discusses the three main application areas where barriers are used: road traffic noise, railroad noise, and ground-based aircraft operations.

The main conclusions of the Working Party are summarized below:

1. There is a strong body of evidence to support the use of barriers as an effective method of abating transportation noise.
2. The best descriptor of barrier performance is its insertion loss, which is the difference in the noise environment before and after the barrier is constructed.
3. It is the collective experience of the Working Party that the most common values for A-weighted insertion loss range between about 5 to 12 dB.
4. Barrier height is of fundamental importance to the effectiveness of a barrier. Proximity of source/receiver relative to the barrier is also of fundamental importance to the insertion loss provided by a barrier.
5. The material used to construct barriers must be such that there is sufficient transmission loss of sound through the wall. It is also important that there be no significant air gaps in the structure nor between the barrier and the ground.
6. Sound-absorbing material may be important in reducing noise between parallel reflective walls

Finally, recommended directions for future research are presented.

This report is published in full in the September 1999 issue of Noise/News International. ❖

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John James Knight OBE FIOA

A Founding Father of British Audiology

John Knight OBE PhD FIOA died on July 24th 1999 aged 78 years.

John graduated from Imperial College, London in 1941 with an honours degree in physics. He was commissioned into the Signals Branch of the RAF and subsequently attached for radar research to the Telecommunications Research Establishment at Malvern. After the war he returned to Imperial College where, with R W B Stephens, he founded an acoustics research group. John's interest in acoustics was now established. At about this time the Medical Research Council began work on electric hearing aids which were to be provided through the newly-created National Health Service. The Council Committee on Electro-acoustics comprised an astonishingly distinguished cast of scientists including the Cavendish Professor of Experimental Physics, Sir William Bragg. Their work on the first 'Medresco' hearing aids is well known and has never been bettered, for in a few months they had designed, produced and tested a hearing aid which could be distributed through hospital ENT departments. It was in this new post-war climate of optimism and innovation that John began his lifelong career in audiological physics.

In the early 1950s John joined the scientific staff of the Wernher Research Unit on Deafness. This was a small research team sponsored by the MRC under the directorship of another physicist, Thomas Littler. Their work was concerned, among other things, with the devel-

opment of hearing aids and the standardization of audiometric equipment and test procedures. John remained with the Unit until its dissolution in 1964 on the retirement of Dr Littler. Nearly thirty years later, in the 25th anniversary year of the British Society of Audiology, John was awarded the Thomas Simm Littler Lectureship and presented his address to the Society during its annual conference in Bath.

The Medresco hearing aids were available on the first day of the National Health Service, 1 August, 1948. Although ENT surgeons were responsible for general patient care and for the prescription of hearing aids the technicalities of hearing assessment and hearing aid fitting were devolved to a new professional group – the audiology technician. From the outset there was a need to educate and train, and in 1949, at a request from the Ministry of Health, a course was established at the Institute of Laryngology & Otology. John, together with Thomas Littler and Edith Whetnall was instrumental in running this course. As the technical profession developed other courses came in to existence and the need to coordinate the education and training nationally was ultimately met by the British Association of Audiology Technicians. John became their Chief Examiner – a role in which he continued without interruption until the end of his life. Indeed he was still lecturing on his 50th ILO course in the spring of 1999. John's special contribution to technician training was a meticulous attention to detail and an insistence on the importance of the basic sciences. His support for the profession as it evolved to meet new demands over the years was unrivalled and unprecedented.

On the retirement of Dr Littler, John accepted the post of physicist at the Institute of Laryngology & Otology. Later the position of honorary consulting physicist to the associated Royal National Throat, Nose & Ear Hospital enabled him to set up the prestigious Department of Audiological Physics in Gray's Inn Road. He continued in this capacity until his retirement, occupying himself with teaching, research, calibration and standards. He published some 150 papers on acoustics and audiology.

One of John's special interests was occupational noise and during his career he was directly involved in the assessment of numerous claims for compensation. His PhD thesis (1962) was on the 'Effects on Hearing of Auditory Hazards'. He was a member of the MRC Working Party on Occupational Deafness, 1960-65, and one of the leaders in charge of the MRC field team on the National Survey of Occupational Hearing Loss. This survey lead ultimately to Robinson's model for predicting occupational hearing loss and publication under the authorship of Burns & Robinson of *Hearing and Noise in Industry*. Coincidentally, Douglas Robinson and John Knight were exact contemporaries, each born in 1920 and dying within a few weeks of each other.

John was particularly involved with standardization and he remained active in this field until his death. He served on numerous technical committees including the BSI committees EPL/29 Electro-acoustics and EH1/1 Thresholds of Hearing. He was the UK expert, and indeed one of the original members of IEC Working Group 10 which published the first of the current standards on pure tone audiometers. He was also the UK expert on the IEC Working Group which produced IEC 1027 (1991) on 'Instruments for the measurement of aural acoustic impedance/admittance'.

John also served on many professional committees including the MRC Hearing Subcommittee of the Royal Naval Personnel Research Committee, 1958-1964, the Department of Health's Advisory Committees on Audiology, 1974-1981 and the Hearing Aid Council, 1975-1981. He was Chairman of the Acoustics Group of the Institute of Physics, 1970-1972, Member of Council of the Institute of Acoustics, 1972-1974, Member of Council of the Commonwealth Society for the Deaf, 1972-1994 and Member of the Assembly of the Royal National Institute for the Deaf, 1986-1994. From 1986 until his death he was Chairman of the Trustees of LINK Rehabilitation Centre, Eastbourne, and from 1988 Vice-Chairman of Oak Lodge School for the Deaf. In July 1977 he was made a Fellow of the Institute of Acoustics and for some fifteen years served on the Institute's Education Committee.

John had an abiding sense of duty. He never seemed to hurry unduly but somehow he was always at hand when needed and one found that he had always completed whatever task had been accepted. He was by nature a perfectionist, critical of error, however small. Yet he presented a wonderfully balanced character, always showing kindness and gentleness. Tolerance masked his intolerance and patience his impatience. Like many of his generation he was fascinated by, but was wary of, today's technology; pen and paper and a keen mathematical brain were his tools. It seemed that John would go on for ever, for he never appeared to age, and his final illness after a lifetime of good health must have come as a shock to him. He bravely fought his illness in his usual quiet but confident way.

In 1984 John was created an Officer of the Order of the British Empire. This was indeed a fitting recognition to his service to audiology, to the hearing-impaired and to his country.

Peggy Chalmers
Peter Haughton ❖

New Products

MICROSTAR LABORATORIES (UK) LTD

New Data Acquisition Board

Microstar Laboratories has announced the new iDSC 1816 PCI board: a high-performance, 8-channel, 16-bit resolution Data Acquisition Board for PC-based systems that need anti-aliasing filters to remove spurious high frequency harmonics from the captured data. The board uses a unique combination of advanced analogue filter techniques and proprietary digital filter algorithms to achieve the virtual brick-wall filters needed for critical results in spectral analysis applications where high accuracy is required over several channels. It is ideal for applications such as sonar and monitoring vibrating and rotating assemblies in the automotive, aerospace and power generation industries.

The iDSC 1816 features data acquisition with 16-bit resolution, optical isolation and anti-aliasing, 8 inputs with simultaneous sampling and independent filters. It has onboard filters with flat passbands, linear phase and steep roll-off, wide-ranging cut-off frequencies up to 61.44 kHz, selectable by channel expansion to 112 simultaneous channels in one PC. Performance is said to be outstanding: during benchmark testing, four IDSC boards installed in a single PC read 32 channels simultaneously with a throughput of close to 5 MSamples per second. The boards are said to be very cost-effective, providing anti-aliasing filtering complete with data acquisition and graphically programmable filters capability at similar prices to competitors' stand-alone anti-aliasing filter boards.

All Microstar Laboratories boards have onboard intelligence: a 32-bit multitasking real-time operating system leaves the PC processor available for the user interface and for other tasks that do not require dependable sub-millisecond responses. Any combination of up to 14 iDSC and DAP boards can run as a single system in the same PC, and any number of workstations can be networked.

For further information contact Martin Brabham, Microstar Laboratories (UK) Ltd, Westminster House, 77-79 High Street, Egham, Surrey TW20 9HE Tel: 01784 471313 Fax: 01784 471919
e-mail: mbrabham@dial.pipex.com
web: www.mstarlabs.com

ABB CONTROL LTD

Ultrasonic Sensor Remote Programming

ABB Control's new remote programming tool virtually eliminates the problems of setting up ultrasonic position sensors – traditionally an awkward job. Ultrasonic sensors have near-immunity to dirty conditions and a long sensing range, but they can be difficult to set up because the instrumentation engineer must physically reach the sensor to set the thresholds. In many installations this is difficult or impossible.

The new programming tool simply connects via a 1.5 m cable between the sensor and its connector cable; all that is needed are two button pushes to set maximum and minimum sensing values, then the unit can be removed. This solution is more accurate than the alternative of setting thresholds via potentiometers, which can 'drift'.

Ultrasonic sensors determine position by measuring the time taken for an ultrasonic pulse to be reflected from the substrate. Output responds to changes in position typically within 100 ms, and are linear to within 0.1 per cent. Resolution can be better than 0.2 mm even at a sensing distance of several metres.

The output of ABB Control's ultrasonic sensors are automatically compensated for changes in ambient temperature. Shock and vibration performance exceed the EN 60974-5-2 standard, and the sensors have IP65 ingress protection rating.

ABB Control now has a range of 200 position sensors, sufficient to meet 80 per cent of system builder, OEM and end-user needs. They are available from ABB Control's Coventry distribution centre and from a network of distributors.

For further information please contact: Conrad Slater, ABB Control Ltd, Grovelands House, Longford Road, Exhall, Coventry CV7 9ND Tel: 01203 368500 Fax: 01203 368401

NAG LTD

NAGWare f95 Compiler for LynxOS

The Numerical Algorithms Group (NAG) Ltd has announced that their NAGWare f95 Compiler will be released shortly on the LynxOS platform. NAG produced the world's first Fortran 90 compiler and the latest release (NAGWare f95 Compiler, Release 4.0) is the world's first compiler that implements features that will be included in the next standard, Fortran 2000. NAGWare users therefore can take advantage of these constructs while retaining the proven reliability and stability of the NAGWare compiler.

The NAGWare f95 Compiler has been available for some time on a wide range of Unix platforms and thanks to its inherent portability this range has now been extended to Lynx Real Time Systems' LynxOS. Initially the compiler will be available on the PowerPC, but it may subsequently be ported to other hardware platforms operating under LynxOS.

Release 4.0 includes features defined in two major Technical Reports, commissioned and accepted by the committee responsible for the development of the Fortran standard (J3):

1. Allocatable Components. The allocatable attribute is now allowed on dummy arguments, function results and structure components.
2. IEEE Floating-Point Exception Handling. Modules are provided to access and control IEEE floating point arithmetic.

The NAGWare f95 Compiler's extensive compile time and run time checking features have been enhanced further at Release 4.0 by the major addition of runtime procedure argument checking and subscript checking for assumed size arrays.

NAG Mark 19 of the Fortran Library

The NAG Fortran Library is the renowned and comprehensive collection of fully documented routines for mathematical and statistical computation used by industry, universities and research institutes worldwide. The latest release, Mark 19, will shortly be available. It contains more than 60 new routines that extend and improve the functionality available in the areas of Fast Fourier Transforms, optimization, eigenvalue problems, sparse linear algebra, statistics, and operations research.

The addition of a sparse nonlinear programming routine to the existing Optimization chapter will be of particular interest to people wishing to solve large scale optimization problems, such as those arising in financial, engineering and aerospace applications.

The Operations Research chapter has been broadened to include solvers for Quadratic Programming problems where selected variables are constrained to be integer. The rapidly expanding Sparse Linear Algebra chapter now contains iterative methods and pre-conditioners for complex symmetric and non-Hermitian linear systems of equations, which are particularly suitable for the solution of PDE problems. For a full list of the routines in Mark 19 either contact one of the NAG offices or visit our website.

The Library is also callable from other languages such as C, C++, Excel and Visual Basic, so users unfamiliar with Fortran can still take advantage of its mathematical capability. Existing NAG Fortran Library customers subscribing to the support service will receive the upgrade to Mark 19 free of charge.

NAG Statistical Add-Ins for Excel

Anyone wishing to undertake statistical analysis but not wanting to learn a new or complex package will benefit from the NAG Statistical Add-Ins for Excel. By enhancing Microsoft Excel with the NAG Statistical Add-Ins, users are able to undertake regression, time series analysis, generalised linear modelling, analysis of experiments and multivariate analysis from a standard desk-top utility. More details are available at: www.nag.co.uk/stats/ae/ae.html.

The NAG Statistical Add-Ins draw on NAG's highly acclaimed libraries of numerical and statistical algorithms to provide an easy to use interface to 51 of NAG's most popular and useful statistical routines. The algorithms can be accessed via the function wizard and, as with standard Excel functions, the results are immediately updated whenever the input cells are altered.

The NAG Statistical Add-Ins for Excel are conveniently organized into four sections called 'books' and Release 1.1 of the Add-Ins incorporates improved interfaces and user-friendly output. This release has been further enhanced by a revised User's Guide which is available in both on-line and printed forms.

1. Basic Statistics and Probability
Statistical distribution
Summary statistics
Contingency table analysis
2. Statistical Modelling 1: Regression and Time Series
Correlation and partial correlation matrices
Multiple linear regression and general linear model
Linear model specification
Autocorrelation and partial autocorrelation
ARIMA models
Forecasting
Transfer function models
3. Statistical Modelling 2: Analysis of Experiments and Generalised Linear Models
Analysis of block designs
analysis of row and column design:
Latin squares
Multiple comparisons
Generalised linear models
4. Multivariate methods.
Principle component analysis
Factor analysis
Cluster analysis
Discriminant analysis
Multidimensional scaling

For further details on these products contact Fiona Racher Marketing Manager, NAG Ltd, Wilkinson House, Jordan Hill Road, Oxford OX2 8DR Tel: 01865 511245 Fax: 01865 310139 email: fionar@nag.co.uk Web: www.nag.co.uk

ALAN SAUNDERS ASSOCIATES (ASA)

PACE Software for Microsoft Excel

ASA announces the release of PACE v1.0 for Microsoft Excel. PACE is not a spreadsheet, but an 'Add-in' written in Excel's own version of Visual Basic. PACE works as an integral part of Excel to provide a set of twelve additional functions, designed especially for the field of acoustics.

PACE extends the native functions of Excel (eg Sum, average) to include, for example dbsum and dbaverage (logarithmic, addition and average respectively). In addition to those functions above, PACE will return various figures (eg A-weighting, Noise Rating, Noise Criterion) from a series of octave band values. Unlike most other software today, as Excel is already in use on the host machine there are no additional PC requirements to run PACE. Further information is available from: Alan Saunders Associates, The Coach House, Worthy Park, Winchester SO21 1AN Tel: 01962 889466 Fax: 01962 889477
email: mail@alansaunders.com
Web: www.alansaunders.com/pace.html

LMS INTERNATIONAL

LMS SEADS Revision 1.3 Released

LMS International announces the release of SEADS Revision 1.3. LMS SEADS is a state-of-the-art predictive Statistical Energy Analysis (SEA) product that helps engineers to model the vibro-acoustic behaviour of complex systems in the higher frequency range where methods such as FEM and BEM tend not to work so well.

Among the several new features that this latest product release provides are entirely new refinement capabilities that allow the tracing of critical vibration and sound pressure levels back to the sources and panels that contribute most to the predicted energy levels. Results from a transmission path analysis can be post-processed using a range of new tools which allow the most critical energy paths from source to receiver to be visually traced. Meanwhile, new contribution analysis tools allow the user to rank the importance of individual external sources as a function of frequency.

LMS SEADS supports the optimization of trim panels by the use of an integrated tool which can predict the vibro-acoustic response of 2D multi-layered absorptive panels, including transmission and absorption characteristics. With its new release, LMS SEADS now provides a full coupling of the 2D multi-layered panel models to structural plate elements, including structural excitation capabilities.

LMS SEADS is part of a full suite of Noise & Vibration CAE products, that support an integrated process that uses upfront analysis at the concept stages – and test data when appropriate – and manages refinement and cross-disciplinary product optimization using virtual models. LMS' portfolio of Noise & Vibration CAE products allows the analysis engineer to address vibro-acoustic refinement and optimization issues over the entire audio frequency range.

LMS CADA-X on Windows NT

LMS International has announced the release of LMS CADA-X under the Windows NT operating system. The LMS Noise & Vibration testing portfolio now ranges from a compact PC-embedded instrument with a few channels, to a laboratory system spanning hundreds of channels. The performance of the NT-based solution is similar to that of the workstation solution. In general, however the cost of the hardware is significantly lower.

All LMS CADA-X noise and vibration solutions are completely interoperable: users in a networked environment can mix and match PC and workstation platforms, Unix and Windows NT operating systems, HP VXI and LMS SCADAS III data acquisition front-ends – seamlessly sharing floating software licenses and maintaining transparent access to databases.

The LMS CADA-X software suite for multichannel testing and analysis covers a broad range of applications: rotating machinery testing, structural testing, acoustic testing, time data acquisition and processing, multi-axis actuator control. A full set of Information Management Tools handles the vast

quantities of data that are generated and helps link the worlds of field-testing, laboratory testing, test data analysis and enterprise-wide reporting.
For more information on these products contact Bruno Massa, Marketing Communications Manager, LMS International, Interleuvenlaan 68, B-3001 Leuven Tel: +32 16 384 200 Fax: +32 16 384 350 e-mail: bruno.massa@lms.be web: http://www.lmsintl.com

NEWS

CSTB

Research

A team of 40 acoustics engineers at the CSTB (Centre for Building Science and Technology) undertakes noise measurement programmes and carries out studies on the propagation of sound waves. For building companies wanting to test the acoustic performance of their windows or doors, the CSTB has constructed a 'phonoscopy' test bench. This tool uses a novel principle of acoustic imaging which represents the propagation of noise in the form of an image. It makes it possible to produce a noise map of the product when measuring its acoustic insulation. An automatically positioned microphone captures the sound signals and sends them to a computer, which draws a vibration speed map of the product.

The CSTB also supplies software known as Epidaure for the designers of auditoriums and concert halls to help them optimise the acoustic quality of their designs, which has already been successfully used at the Opéra-Bastilie in Paris as well as the Bolshoi in Moscow and the New Academy of Music in Stuttgart. For predicting noise levels around roads and railways, the CSTB has developed software called Mithra. This takes into account the effects of the ground, the relief and even the weather on the propagation of noise over large distances. 'In the large forest in the Landes, bordering the Atlantic, we ourselves studied the effect of a curtain of trees on road noise,' says Jacques Roland, head of the CSTB's acoustics department. 'We showed that a curtain of trees a few tens of metres deep reduced noise by 5 dB, which is a considerable effect.'
For further information, contact French Technology Press Bureau (part of the CFME ACTIM organisation), 21-24 Grosvenor Place, London SW1X 7TB Tel: 0171 235 5330 Fax: 0171 235 2773 e-mail: info@ftpb.u-net.com

SEALMASTER

Three Millennium Product Awards

The Design Council has selected three types of Sealmaster seals for Millennium Status as part of its initiative to find up to 2000 products which are pioneering in their field. The search was launched by Prime Minister Tony Blair who challenged businesses to show that Britain is the creative powerhouse of the world.

The news was announced by Scottish Deputy Minister for Enterprise Stephen Nichol MSP at the Lighthouse building in Glasgow on 6 September.

Plans were also unveiled for the first time about one of the exhibits planned for the Millennium celebrations at the Dome. A giant, technologically advanced piece of land art called the 'Spiral of Innovation' in the Meridian Quarter will display Millennium Products including Sealmaster's.
For more information contact Charles Malcolm-Brown on: Tel: 01223 844204 Fax: 01223 847414 e-mail cm-b@msn.com.

THE NOISE CONTROL CENTRE

Buy Out at Noise Control Specialist

Noisco Products Ltd, the Melton Mowbray company which trades as The Noise Control Centre, has been acquired by a management buy out team led by John Profit, managing director of the business for the past 20 years. The purchase from Headway PLC is in a deal worth around £1.6 million.

'World Class' Acoustics at World Space Studios

World Space have recently commissioned their highly impressive new office and satellite broadcast studio complex in London's Soho Square.

The refurbished facility is stylishly modern in its design concept with a striking colour co-ordination running throughout, including the three 'on air' studios which have all been acoustically treated by sound specialists, The Noise Control Centre of Wokingham, Berkshire.

The purple, gold and blue fabrics were specially selected by the architects and were integrated into the patented Phototrack stretched fabric system, which was applied to all the walls and ceilings of the studio by NCC's installation team.
For more information contact The Noise Control Centre, Toutley Road, Wokingham, Berkshire RG41 5QN Tel: 0118 977 4212 Fax: 0118 977 2536
The Noise Control Centre is a Sponsor Member of the Institute.

VAN CAMPEN ALUMINIUM

Name Change

The name of Van Campen Aluminium has changed to Reynolds Special Products BV.

Since 1990 Van Campen Aluminium has been part of Reynolds Aluminium Holland BV, subsidiary of the globally active and renowned Reynolds Metals Company.
For more information contact Reynolds Special Products BV, Kolkweg 1, 8243 PN Lelystad, The Netherlands Tel: +31 320 27 78 88 Fax: +31 320 26 00 92.

SOUND REDUCTION SYSTEMS LTD

New Soundblocker Leaflet

Sound Reduction Systems have launched a new leaflet on their full range of Soundblockers which gives important at-a-glance technical details.

Soundblockers are stated to provide one of the most comprehensive systems available for reducing breakout of sound through suspended ceilings, and the new leaflet gives test results detailing the level of sound reduction to expect in a range of different site situations.

The leaflet also details the different types of Soundblocker on offer,

from Soundblocker 16, said to be ideal for stopping or considerably reducing cross talk through the ceiling in a standard office, to Soundblocker Plus, which reduces high noise levels through floors and the breakout of environmental noise through roofs.

Formed from a rigid attenuating layer bonded to an acoustic foam, Soundblockers are ideal for installation in both lay-in-grid and metal tray ceiling systems.

Sound Reduction Systems say the new brochure provides a reference guide as to which Soundblocker to use in each different situation, providing at a glance, easy to read information.

For further information contact, Eddie Williams, Sound Reduction Systems, Adam Street, Off Lever Street, Bolton BL3 2AP Tel: 01204 380074 Fax: 01204 380957

A. PROCTOR GROUP LTD

New Laboratory

A. Proctor Group's Acoustic Laboratory was officially opened on 1st September 1999 by Professor John Mavor, Principal and Vice Chancellor of Napier University.

The Laboratory, stated to be one of the most advanced facilities of its type in Europe, was designed in collaboration with Napier University and allows The A. Proctor Group the facility to continue improving and developing their wide range of acoustic products.

Guest Speakers, who included Professor Robin Mackenzie of Napier University and Geoff Pitts from TRADA gave technical presentations to a gathering of over 100 delegates which included architects, building control officers and Housing Associations.

The privately owned laboratory consists of three chambers – two source and one receiving chamber. This allows for both floor and wall systems to be tested and researched and has led to the development of the Prowall and ProCeiling Systems.

With an extensive library of test results available, The A. Proctor Group believe that they can provide their customers with one of the best technical services in the UK.

For further information, contact: Angela McIntyre, The A. Proctor Group, The Haugh, Blairgowrie, Perthshire PH10 7ER Tel: 01250 872261 Fax: 01250 872727 e-mail: insulation@proctor-group.co.uk.

A. Proctor Group is a Sponsor Member of the Institute.

IAC LTD

Tennex Europe Test Rooms

Two special semi-anechoic test rooms form part of a brand new £5m technical centre at the Salisbury, headquarters of automotive component manufacturer, Tennex Europe. The new test rooms were designed and built by Winchester-based IAC and provide Tennex with the means to measure, very accurately, the noise emissions of individual automotive components and complete vehicles. The company will use its smaller 'white noise' test room to measure the sound levels of its own products – such as air induction systems – in order to develop quieter versions of these components. In the larger

room it has the ability to assess the noise levels of components when installed in the vehicles of its major customers, which include Ford, Nissan, Rover and Honda.

Both test rooms were built by IAC using its unique Metadyne sound-absorbing anechoic wedges. Unlike conventional wedges, made of fibreglass or foam, the metal-faced wedges are washable, paintable and highly resistant to damage and fire. More importantly, their acoustic performance is fully compliant with relevant international standards, such as ISO 3745.

The Tennex test rooms are among the quietest of their kind in the world. The vehicle test room has a cut-off frequency of below 100 Hz and an ambient noise level of less than 35 dB ($L_{Aeq,\ 1\ minute}$), despite the fact that, at the time this was recorded, RAF fighter aircraft were flying at very low level over the test facility building! The white noise test room has a cut-off frequency of below 125 Hz and an ambient noise level of just NR20.

In addition to constructing the anechoic room structures, IAC was responsible for several other important aspects of the project, including the provision of a 2-wheel drive acoustic chassis dynamometer, all mechanical and electrical services, lighting, fire suppression, vehicle exhaust and gas detection systems.

New Jaguar Vsac Test Centre

IAC has completed a major turnkey project to provide Jaguar Cars with one of the world's most advanced automotive noise and vibration testing centres. The new facility has a large (17 m x 13.5 m x 5.5 m) vehicle semi-anechoic chamber (VSAC) which, when recently tested to the ISO 3745 standard, surpassed its target cut-off frequency of 60 Hz and was calibrated down to 25 Hz. The chamber is equipped with a 4-wheel drive chassis dynamometer and has a spacious adjacent control room from which vehicle testing can be observed in comfort and safety via CCTV. IAC also provided all of the building's intricate mechanical and electrical services, including its heating, cooling and vehicle exhaust extraction systems.

Like almost every other anechoic chamber built by IAC since 1992 the Jaguar test room was built using Metadyne perforated, metal-faced wedges. The new Jaguar facility is one of several completed this year by IAC for vehicle and automotive component manufacturers throughout Europe and the USA.

For further information, contact Graham Dale, Manager, Special Products, IAC, IAC House, Moorside Road, Winchester, Hants SO23 7US Tel: 01962 873024 Fax: 01962 873123 e-mail: grahamd@iacl.co.uk

Industrial Acoustics Company is a Sponsor Member of the Institute.

ISVR, UNIVERSITY OF SOUTHAMPTON

£1.6 Million Investment

Rolls-Royce plc is to invest more than £1.6 million over five years to establish a Rolls-Royce University Technology Centre at the University of Southampton. The centre, specialising in gas turbine noise research particularly in relation to aircraft engines will be based in the Institute of Sound and Vibration Research (ISVR) at the University's Highfield Campus. A reception to launch the Technology Centre was held at the University on 30 November.

For further information, contact Professor Philip Nelson, Institute of Sound and Vibration Research Tel 023 8059 2367.

KEMO

Buys ex Barr & Stroud Filter Business

Kemo, the South-East London based manufacturer of electronic filters and signal-conditioning instruments, has acquired the former Barr & Stroud filter business – for some time known as Fern Developments – from its previous owners, EIP.

Kemo has bought the EIP name and the design rights to the company's products, which include OEM filter modules that complement Kemo's own range. Kemo will also continue to provide field support for existing EIP customers.

Further information from: Kemo Ltd, 3 Brook Court, Blakeney Road, Beckenham Kent BR3 1HG Tel 020 8658 3838 web: www.kemo.com.

ECOMAX ACOUSTICS LTD

New Theatre Complex

A series of high performance TufSound acoustic panels from Ecomax Acoustics Limited ensures optimum acoustic conditions for all types of performance and activity at the new Milton Keynes Theatre and Gallery complex.

Incorporating a mineral wool sound absorbent core, TufSound is rated non-combustible according to ISO 1182. Each TufSound panel is finished with tissue on both sides and features impact resistant steel outer facing to protect against accidental knocks. The robust performance of TufSound is claimed to ensure durability and cost-effective longevity.

The auditorium features a moveable ceiling which enables easy creation of a wide range of acoustic conditions to suit specific performance requirements. A series of TufSound panels has been installed at a high level in the facility to ensure the quality of these different acoustic conditions. The numerous raised panels are complemented by large strips of TufSound, measuring 600 mm wide and 22 metres in length, which have been installed from floor to ceiling within the fly tower, behind the stage door.

For further information contact: Ecomax Acoustics Ltd, Tel: 01494 436345 Fax: 01494 465274

Ecomax Acoustics is a Sponsor Member of the Institute.

DATA PHYSICS

Acquisition

Concurrent Vibrations SA, a subsidiary of Concurrent Computer France, located in Montigny-le-Bretonneux, Versailles, has been acquired by Data Physics Corporation of San Jose, California.

Concurrent Vibrations SA has been a long standing designer of vibration control and analysis products, ranging from single axis and multi-axis shaker control to data acquisition and frequency domain signal analysis.

ISTAR, as the business was first called, developed vibration solutions in the Unix operating system, and in particular, on Concurrent hardware platforms. ISTAR was acquired by Concurrent Computer Corporation in 1994 and has since ported its complete product range to Windows NT™. The full range of ISTAR solutions for applications in single and multi-axis vibration control as well as modal analysis and dynamic signal analysis will be sold under the trade mark SignalStar, joining the highly successful vibration control and analysis product family SignalCalc.

For further information contact: Data Physics on Tel: 01480 470345 Fax: 01480 470456 web: www.dataphysics.com.

CASELLA CEL LTD

Crowd Noise Record Attempt

Casella CEL were invited by Sky TV and The Guinness Book of Records to measure the crowd noise at Wembley Stadium when they were hoping that fans at the 'Euro 2000' England versus Scotland qualifying match would break the world record of the 'Loudest Noise Made by a Sports Crowd'.

Trevor Lewis, Product Service and Calibration Manager at Casella CEL expected the loudest roar to be when a goal was scored. He set up the equipment, a CEL 480.C1 specially adapted to measure the dBA peak at the England fans' side of the pitch, relative to the halfway line. England failed to score and the record remained intact. Surprisingly, the crowd were very nearly at their loudest, only 0.1 dB below Wednesday night's highest of 123.9 dBA peak – during the singing of the National Anthem.

A report of the crowd noise from the download software, (CEL 6726 dB21) clearly shows the highs and lows of the game.

Further information from: Casella CEL Ltd, Regent House, Wolseley Road, Kempston, Bedford MK42 7JY Tel: 01234 841441 Fax: 01234 841490 email: info@casella.co.uk

Casella CEL Ltd are Key Sponsors of the Institute.

SOUND BARRIER SOLUTIONS LTD

Relocation

To accommodate expansion the company have moved to Coventry. SBS Ltd are noise barrier specialists for highways, rail and industrial projects of all sizes. With noise barrier design becoming an increasingly specialist field, SBS Ltd were formed in 1998 to provide an independent and wide ranging service in barrier specification and design.

Director Giles Parker MIOA holds the Chair of the Environmental Noise Barrier Association and the BSI committee for road barriers and heads the UK delegation to the CEN noise barrier working group.

Further information from Sound Barrier Solutions Ltd, Nettle Hill, Brinklow Road, Ansty, Coventry, Warks CV7 9JL Tel: 024 7661 8356 Fax: 024 7662 2609 email: gfhparker@compuserve.com.

Items for the New Products section should go to John Sargent MIOA, Oak Tree House, 26 Stratford Way, Watford WD1 3DJ ❖

From Colin Waters CEng FIOA

The Editor
Dear Sir
European Noise Policy – Some Reservations

I read with interest the contribution of Bridget Shield to the July-August edition of the Bulletin. She has raised a number of points which questioned both the need for a pan-European noise policy and, if need there be, the possibility that such a policy could ever be devised.

Leaving aside the question of need it would appear to me that the only form that such a policy could take would be one of principle rather than detail. The article drew attention to the differences exhibited by the population across Europe and the likelihood that the different nations would have different expectations and therefore reactions to noise. Accepting this argument also accepts that noise limitations and standards based upon absolute levels can never be generally applicable. The converse argument that any group will have a built-in tolerance to 'an adverse noise' and that that tolerance will be guided by any number of socio-acoustic factors, points towards a noise standard based upon 'interference with other activities'.

For example a Mediterranean country may happily accept high endemic noise levels during the late evening with the result that any new introduced noise would have to be at least as loud as that before any impact is felt. Another country may be in a state of extreme annoyance long before the Mediterranean endemic noise levels are reached. However, if the endemic level of each population is taken as an indicator of acceptable noise levels then the amount by which a new noise exceeds this indicator may be universally applied to adverse subjective response. This then would form the base of a workable noise policy.

Discussion of the methods to be applied to describe the level and character of the incoming noise or indeed the endemic noise, will, of course, be never ending but would have the advantage that it will be irrelevant to the Policy. The benefits or shortcomings of any particular method would be applicable to all populations. Spectral content and subjective response correlation may suggest the use of dBA or indeed dBC but it wouldn't matter which is used in policy terms. Short term noise events or long term energy exposure may suggest L_{max} or L_{eq}, but again it wouldn't matter in policy terms. All that is required is that the pre-existing noise situation and the incoming noise are BOTH described in the same units.

Such a policy based upon a comparison of noise levels would not prejudice any relationship with the WHO. That organisation is seeking to safeguard health and thus any noise relationship can be based upon a physiological response. Such examination lends itself to absolute noise limits. As an example, it is, or mercifully was, not unusual to find workers in a heavy industry saying that they saw no need to wear hearing defenders as they had got used to the noise! What the worker interpreted as getting used to the noise was in fact the result of going deaf. In this context the hearing damage that results is not subject to national differences. As far as damage to the mechanism of hearing is concerned 95 dB has essentially the same result wherever you live. Similarly physiological sleep disturbance can be related to absolute levels.

It is an inevitable result that noise policies and statutory limits become the basis of standards that are examined and tested before tribunals that have legal authority or operate using legal procedures. This aspect of the matter cannot be ignored when the drafting of a European Noise Policy is being contemplated. Any practitioner in the field of environmental acoustics is well aware of the importance of the punctuation, let alone the wording, of a Noise Standard. A Policy based upon a simple principle as suggested would not fall foul of this test for usability, but one based upon defined absolute limits would, as that policy could be shown not to be relevant to all circumstances.

Such a simple policy would be readily understood by the interested lay person. That is not to say that academic research and advancement of methods would be stifled. The Policy would set out the principle and philosophy of the methods to be used across Europe. The actual methods, for example the unit, any weighting for special cases, the time period for the measurement, the time of the measurement and so on would all be open to improvement and refinement.

I hope that the view set out here adds to the essential debate of this important subject.

Yours truly

Colin Waters Acoustics
Great Missenden
Bucks

Book Review Erratum
September/October 1999 Bulletin

Environmental Noise Barriers: A Guide to their Acoustic and Visual Design
By Benz Koltzen and Colin English

Note from Dr A J Pretlove FIOA

The second paragraph of the review by Mr I Watson FIOA should have read:

There are 148 photographs illustrating the wide range of designs and materials which are now used in America and many European countries. Some noise barriers are very substantial structures which will cost millions of pounds to manufacture and erect. Because the UK has followed a compensation policy for property value depreciation and sound insulation, we have lagged many years behind the rest of the developed world in using noise barriers. This means that our industries which could develop and manufacture noise barriers have a lot of catching up to do. It could be a huge market.

INSTITUTE DIARY 2000

14 JAN
Speech Group Mtg Speech Production and Automatic Speech Recognition
Birmingham

19 JAN
1-Day Meeting: The Acoustic Design of Cinemas and Large Leisure Complexes
London

19 JAN
London Branch Evening Mtg: Noise Mapping
London

27 JAN
Reproduced Sound 16 Committee Meeting and Electroacoustics Group AGM
St Albans

28 JAN
IOA CofC in Sound Transmission Within Buildings Exam
Accredited Centres

1 FEB
Professional Development Committee
St Albans

3 FEB
Meetings Committee
St Albans

4 FEB
IOA CofC in W'place Noise Exam
Accredited Centres

7 FEB
Engineering Division Committee
St Albans

10 FEB
Meetings Committee (Groups & Branches)
St Albans

16 FEB
London Branch 1/2 Day Visit Luton Airport

17 FEB
Publications Committee
St Albans

24 FEB
IOA CofC in Sound Transmission Within Buildings Committee
St Albans

1-2 MAR
Measurement and Instrumentation Group Conference: Measuring Noise Outdoors
Home Counties

2 MAR
IOA CofC in W'place Noise Committee
St Albans

7 MAR
Membership Committee
St Albans

9 MAR
Distance Learning Sub Committee, Education Committee
St Albans

16 MAR
Executive Committee
St Albans

23 MAR
Medals & Awards Committee, Council
St Albans

17-18 APR
Spring Conference Acoustics 2000
University of Liverpool

9 MAY
Professional Development Committee
St Albans

11 MAY
Meetings Committee
St Albans

12 MAY
IOA CofC in W'place Noise Exam
Accredited Centres

15 MAY
Engineering Division Committee
St Albans

18 MAY
Publications Committee
St Albans

25 MAY
Membership Committee
St Albans

1 JUN
IOA CofC in W'place Noise Committee
St Albans

6 JUN
Executive Committee
St Albans

8 JUN
Distance Learning Sub Committee, Education Committee
St Albans

9 JUN
IOA CofC in Env Noise Measurement Exam
Accredited Centres

15-16 JUN
IOA Diploma Exams
Accredited Centres

20 JUN
Diploma Tutors Meeting
St Albans

22 JUN
Medals & Awards Committee, Council
St Albans

4 JUL
Professional Development Committee
St Albans

6 JUL
Meetings Committee
St Albans

13 JUL
IOA CofC in Env Noise Measurement Committee
St Albans

7 SEP
Meetings Committee
St Albans

11 SEP
Engineering Division Committee
St Albans

14 SEP
Publications Committee
St Albans

21 SEP
Distance Learning Sub Committee, Education Committee
St Albans

22 SEP
IOA CofC in Sound Transmission Within Buildings Exam
Accredited Centres

26 SEP
Membership Committee
St Albans

28 SEP
Executive Committee
St Albans

5 OCT
Medals & Awards Committee, Council
St Albans

6 OCT
IOA CofC in W'place Noise Exam
Accredited Centres

17 OCT
Professional Development Committee
St Albans

19 OCT
IOA CofC in Sound Transmission Within Buildings Committee
St Albans

26 OCT
Publications Committee
St Albans

27 OCT
IOA CofC in Env Noise Measurement Exam
Accredited Centres

2 NOV
IOA CofC in W'place Noise Committee
St Albans

19 NOV
Meetings Committee
St Albans

20 NOV
Engineering Division Committee
St Albans

23 NOV
Membership Committee
St Albans

28 NOV
IOA CofC in Env Noise Measurement Committee
St Albans

30 NOV
Distance Learning Sub Committee, Education Committee
St Albans

5 DEC
Executive Committee
St Albans

7 DEC
Medals & Awards Committee, Council
St Albans