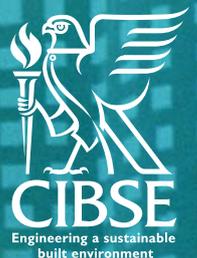
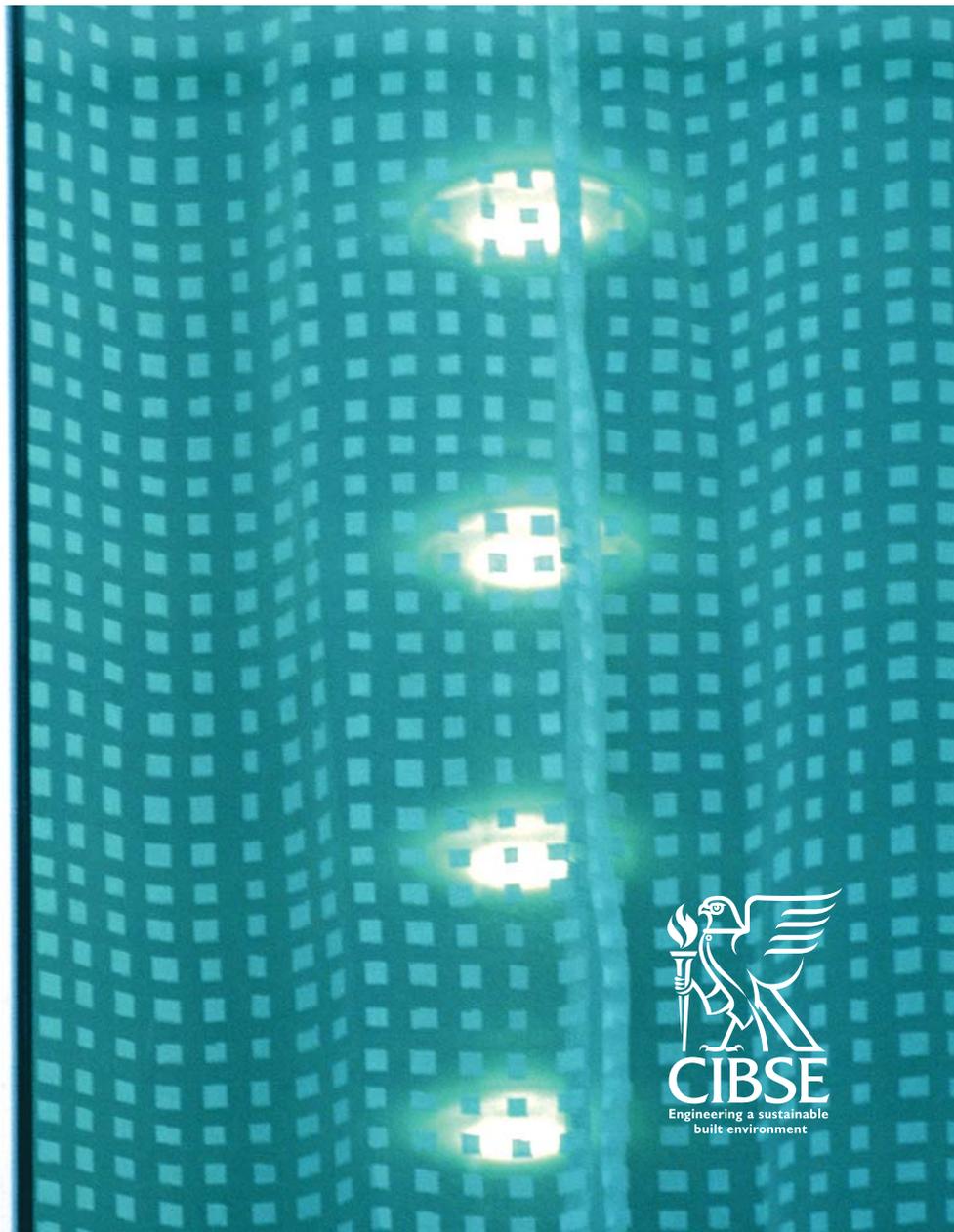
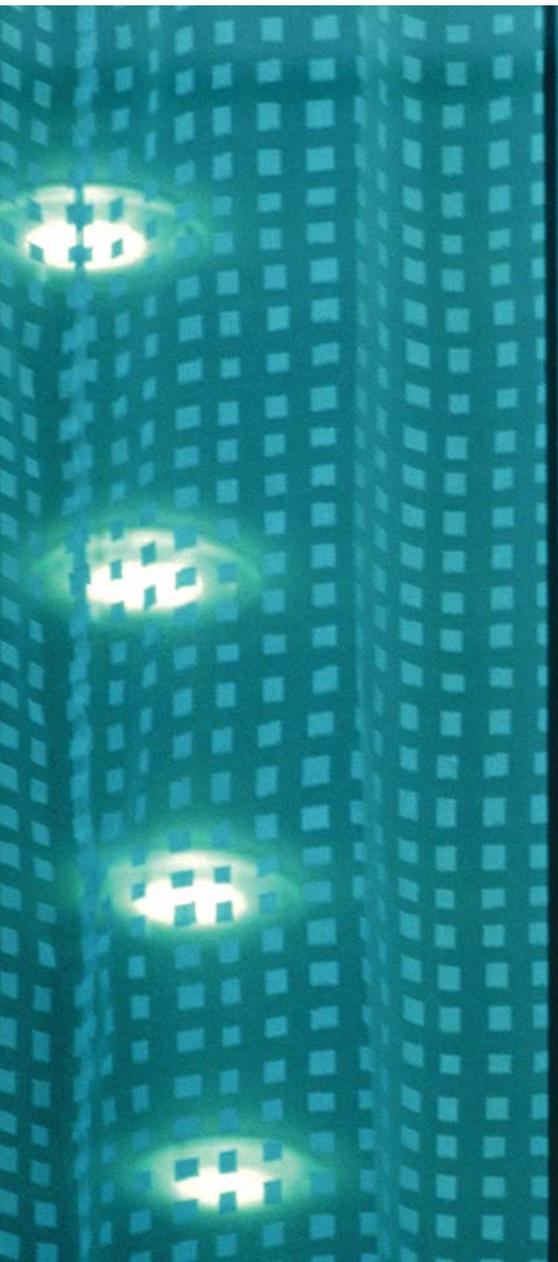


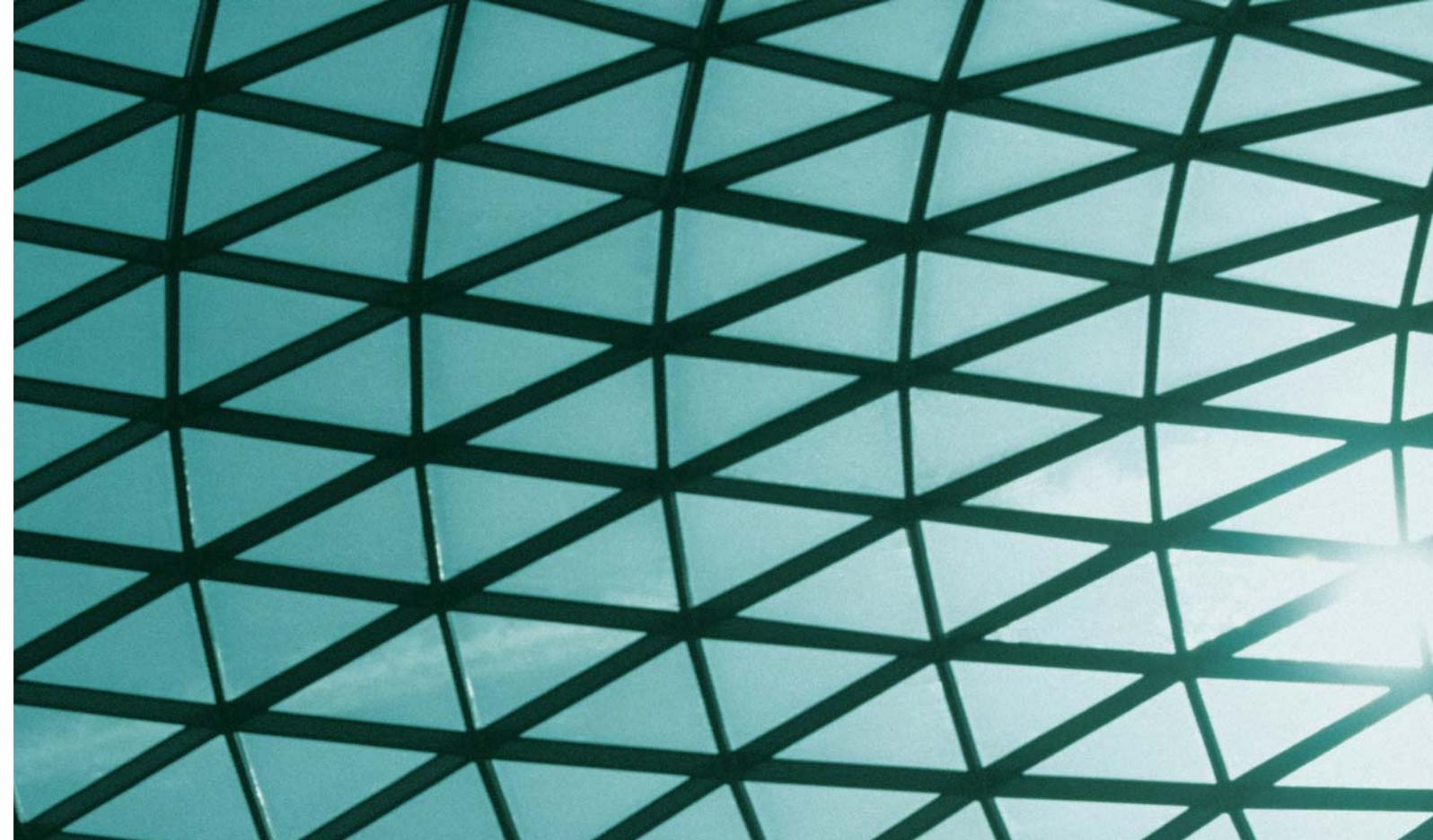
PRESIDENTIAL ADDRESS 2007

Completing the circle

The Chartered Institution of Building Services Engineers



Presidential Address 2007



John Armstrong MPhil, CEng, FCIBSE, MIMechE, MBIFM

John Armstrong has spent his working life in the management, care and maintenance of buildings and their engineering services. He is currently a self-employed property consultant specialising in engineering maintenance. He graduated from Loughborough University in 1968 with a Diploma in General Engineering, gained a Diploma in Management Studies at Stoke-on-Trent Polytechnic in 1972 and Master of Philosophy from Brighton Polytechnic in 1988.

Before setting up his own consultancy John spent 18 months at Ove Arup and Partners in Facilities Management, 11 years in the Property Department of Barclays Bank, seven years leading the Building Operators Section at the Building Services Research and Information Association (BSRIA) and eight years in the Health Service.

He is a recognised specialist authority in building services maintenance having produced several publications. These include the CIBSE Guide to Owning, Operating and Maintaining Building Services, prepared by their Maintenance Panel, which he chairs, and the CIBSE Concise Handbook.

During his time as President Elect of CIBSE, he was involved with international activities, attending a tour of Dubai, Hong Kong and Shanghai and seeing first hand the huge construction developments in these areas and discussing with local representatives the need for a greater understanding and application of Facilities Management to improve their operation and maintenance. He is Chairman of the Maintenance Task Group and a member of various CIBSE committees such as the Whole Life Performance Task Group, and Publications and Research Delivery.

Completing the Circle

The Good News

CIBSE, the Chartered Institution of Building Services Engineers, can justifiably be proud of the position it is in today, one hundred and ten years since it began as the Institution of Heating and Ventilating Engineers.

We are able to sit comfortably at the top table in the design process, participating fully, and in many cases leading, the interpretation, development and achievement of our clients' aspirations. We are recognised by Government as playing a major role in their climate change programme. We take an active role in the Group of Fifteen leading Professional Engineering Institutions. We have a membership base which is growing, and which supports a vibrant and dynamic

regional structure, both national and international, with 20% of our members from outside the UK. Our specialist Groups cover an expanding range of the many facets of knowledge needed to successfully design and install engineering services into buildings and subsequently to operate and maintain them. We now have a very active and growing Young Engineers Network of which I am very pleased to act as Champion.

A Beginning

In this address I would like to share with you some thoughts and experiences in the life of an engineer who has been very much involved in the Cinderella area of our profession: the operation, care and management of completed buildings and their engineering services.

My career began as a student of general engineering, I moved through the steel industry, Michelin Tyres, the Health Service, BSRIA, Barclays Bank and Arup to my current role, as a consultant.

Looking back, you sometimes wonder how you arrived at where you are. In my case, as one of the post war baby boomers, I was brought up in a period of hope and determination created by a country which had sunk to possibly its lowest ebb through a very difficult and challenging world war. When I arrived, the country was resolved to provide every opportunity for its future generations. We were born into the National Health Service, provided with state education, witnessed a country aiming to be at the forefront of the world in terms of technology, manufacturing, scientific and engineering achievements. Those times provided huge opportunities for the members of this Institution. The immense building programmes being undertaken included hospitals, schools, universities, housing, manufacturing, offices and transport. All these areas saw major developments needing the knowledge, skills and expertise of our members. Some 30 years ago, however, I began to have concerns that those running and maintaining buildings, plant and services were not always fully recognised and appreciated.

Challenges and Concerns

By the turn of the last century, when we were all getting excited about the new millennium, David Wood directed us towards a sustainable future to enable people to enjoy a better quality of life without compromising the quality of life for future generations. John Egan two years earlier had identified some challenging targets for the construction industry such as reducing both capital cost and construction time by 10% and reducing construction accidents by 20%. The Kyoto agreement had been signed in 1997 with the UK agreeing to a reduction in greenhouse gases of 12.5% by 2012, now less than five years away.

Where are we in 2007? Climate change has certainly been accepted and we find it thrust in our faces every day on television and in the papers. The Intergovernmental Panel on Climate Change reported last February that emissions of greenhouse gases are expected to be changing the climate over the next 100 years. We have been made well aware of its implications to ourselves as individuals, to the UK as a nation and worldwide.

Within the professional institutions there is a strong tide of debate at present about the concept of 'contraction and convergence'. This is defined by the Global Commons Institute as a framework for a smooth transition to a low level of greenhouse gas emissions from human activity. Contraction means stabilising greenhouse gases at a safe and stable level with annual reductions towards that target. Convergence is contraction's accompanying 'second step'. It defines an equitable distribution of carbon emission rights among states. In other words the CO₂ allocation for



each nation and the change that nation must make each year to reach the safe target. For developed countries such as the UK this must mean a reduction.

To put this into some perspective, in one week this year, you and I, average UK householders, are responsible for the same amount of carbon emissions as the average person in the world's poorest countries would produce all year. The World Development Movement suggests that each person should be limited to 1.1 tonnes CO₂ per year. By my calculations, at our present use, that means that by mid-February we had more than used up our allowance.

Perhaps this gives an indication of the size of the challenge facing us. It also helps to explain why, in December last year, David Miliband, the Environment Secretary, was raising the possibility of carbon trading credit cards. He also stated *'you cannot tackle the climate change problem if you are not serious about social justice'*. I believe there must be a social element involved with reducing energy use since it is the people in the buildings who determine how much is used. David Hughes, in his address at this time last year, reminded us under the very relevant heading of 'Redefining our boundaries' that the late Anne Hemming of the then ODPM Office had stated *'it is people that emit carbon, not buildings'* and *'we can provide energy efficient buildings but not control lifestyle'*.

In my view, CIBSE's view of contraction and convergence is not inspired and somewhat contradictory. On contraction we are in no doubt that the principle of identifying a target CO₂ concentration for the atmosphere, and helping the UK and other nations move towards it, is one which

CIBSE can and does support since it cannot be achieved without reducing the energy used in buildings.

But CIBSE sees convergence, or the complementary need to move individuals and nations towards achieving that target, as an economic process that must follow a political agenda. CIBSE does not see itself sitting comfortably in this arena when its role is to be a learned society of an engineering discipline. Yet it is people who occupy, run and operate buildings. I contend that CIBSE needs to be part of the understanding process of how behaviour can be influenced to reduce energy use and CO₂ emissions.

I therefore have a problem with the position of CIBSE. Our Institution is one of the few professional institutions managing to grow its membership. It has also identified potential growth areas among such practitioners as climatologists, environmental specialists, physiologists and psychologists. Whether we like it or not, we are moving into areas of social awareness and influence, and will be asked where as an Institution we stand on many of these literally vital issues. It is safe and easy to claim that convergence is an economic and political issue, but it is convergence which will drive the engineering and technology agenda of the future. If we do not modify our stance, we will not just find ourselves left out of the debate about how that agenda develops and is put into practice here and across the world. We will also deprive the communities in which we live of the unique contribution only we can make to solving the problems. Climate change presents CIBSE's membership with the greatest, most important responsibility this Institution has ever faced. We must not shirk that responsibility for fear of getting our hands dirty.

The Impact of Climate Change

A sobering thought whilst on the issue of climate change is the growing concern about regional changes in temperature, possibly up to 5°C. Such temperature changes have indeed occurred in the past, and some would say therefore that the world's population should not be concerned about it. This argument fails to recognise the accepted fact that it is today's human activity which is causing the atmospheric changes in temperature. Human activity has caused and is causing these problems, so to adapt a quotation from Mahatma Gandhi in relation to this situation, '*we must be the change we want to see in the world*'. It is also interesting to note that 4,300 years ago a similar change in temperature occurred, though in that case it became cooler. At that time there was a profound effect on civilisations such as the Old Kingdom in Egypt, early Bronze Age Societies in Anatolia, Greece and Israel, the Indus Valley civilisations in India, and the Hongshan culture of China. Those temperature changes were not caused by mankind, and did not risk mankind's future.

Today's changes are altogether different and we can and must do something about them, collectively and as individuals.

A figure quoted by many speakers in relation to UK energy use is that some 50% is used in buildings. This can be sub-divided further into 65% domestic and 35% non-domestic. Whichever way you consider the figures, property in all its forms consumes a huge amount of the UK energy. At one time it would also have been possible to say our own UK energy reserve when coal, gas and oil were abundantly available within and close to our shores. This is no longer the case and with coal being imported from Europe, gas from Russia and oil from the Middle East, the implications in terms of reliability of supply and guarantee of availability must be a growing concern. Taking into account our current concerns about sustainability, we must also include the availability and use of water as another major issue.

The Long Reign of Fossil Fuels

The Presidential Address of 50 years ago talked about 'the long reign of so-called fossil fuels being threatened by nuclear energy' and interestingly also noted 'wastage of heat looks like becoming a punishable offence'. Some things have changed but it is interesting how some issues keep coming back.

So, we have 50% of energy being used in buildings to provide heating, cooling, lighting and power. These all relate to our description of building services, the focus of our Institution. The day-to-day use of these services is the responsibility of the building users but, though some of them are influenced by energy managers, this is a role and opportunity that could be said to not have achieved its full potential.

Facilities Managers

Facilities managers play an important role in how buildings meet the needs of owners, operators and building occupants. Facilities management is defined by the British Institute of Facilities Management as the integration of multi-disciplinary activities within the built environment and the management of their impact upon people and the workplace. Facilities managers must be regarded as important people in the operation, management and maintenance of our building stock. A growing number of CIBSE members now work in the FM arena.

At this point it is worth including another statistic. Only about 2% of the building stock is replaced or refurbished each year, meaning that some 98% of the UK building stock is already in place, many to out-dated energy and engineering standards. Some buildings are already 100 years old, a few even older. Managing them to provide internal comfort is not a new profession. Why therefore, have building services designers been so reluctant to seek the experience and knowledge of building operators to improve their designs?

The PROBE Studies published in the CIBSE journal, BSJ, provided an insight into how buildings perform in use by reviewing how the design intent had been achieved in practice. Anecdotal evidence suggested many designers found this information very useful, but possibly many designers breathed a sigh of relief that it was not their building being put under the microscope. And what happened to the PROBE concept, begun in a blaze of publicity but only kept moving and funded by incredible efforts by a few stalwarts? It was finally brought to rest by the insurmountable problem of no further financial support.

Our industry is very competent and rightly proud of its abilities and skills to provide complex solutions based on well researched engineering principles and the huge amounts of basic physical data CIBSE provides in publications such as the design guides.

Look Back and Learn

Where I believe we have a difficulty is the willingness to look back and learn from the ways constructed projects have been operated and how well or badly they met the client – or user – expectations.

This isn't straightforward. A building's success is influenced by the detail of the design and quality of the construction process, how many times the client changes his or her requirements during these key processes, and the way it responds to the needs of the occupants during the lifetime of the completed building. I can offer an example of the nature of the difficulty. When working at BSRIA on the problems of building operators and owners, I was frequently asked for what would now be called 'benchmark data' giving good-practice examples of building performance against which building operators could measure and compare. Anecdotal information suggests this is still one of the major questions raised. For the best part of 25 years I have sought such information. Despite being told on many occasions it exists, I have found a

very limited number of examples of published data. I am led to conclude that as an industry we grab the 2% of new-build opportunities because they are exciting, challenging and fee earning, but fail to look back at the 98% of buildings, some of which are successful and meet the client's expectations, but unfortunately there are some that do not.



Completing the Circle

My message therefore for this address is to make a plea for better understanding between facilities managers, building operators and those undertaking design. Facilities managers and building operators have a wealth of experience and knowledge which is not readily sought by designers. It may be that historically those taking on the role of facilities managers did not have the confidence to meet the services designers as equals, but that must be a thing of the past. To fully complete the circle, we must as a profession be prepared to judge how buildings have performed in practice, acknowledge where there have been significant successes but also recognise that not all buildings have been perfect and there is considerable room for improvement.

We are moving very quickly into a requirement for building performance to be evaluated whether we like it or not. The Energy Performance of Buildings Directive will shortly make regular inspection of air-conditioning plant a requirement together with, building energy performance certificates which are almost in place. Major property operators such as the British Retail Consortium are offering to put energy performance certification in place before it is mandatory because they see it as a good thing.

We as an Institution must be able to demonstrate that we are completing the circle by actively seeking to know how buildings are performing and using this to make future buildings better. It could be said that this should have already happened. I see Climate Change as the catalyst which forces us to make it happen.

“To fully complete the circle, we must as a profession be prepared to judge how buildings have performed in practice, acknowledge where there have been significant successes but also recognise that not all buildings have been perfect and there is considerable room for improvement.”



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