Preface

The 8th International Symposium on Heating, Ventilation, and Air Conditioning—ISHVAC2013 is held in Xi'an, China from October 19 to 21, 2013, organized by Xi'an University of Architecture and Technology and co-organized by Tsinghua University and The University of Hong Kong. The proceedings consist of over 220 peer-reviewed papers presented at the ISHVAC2013. We sincerely hope that the 8th International Symposium of Heating, Ventilation, and Air Conditioning will provide a good platform again to HVAC experts and researchers in China and elsewhere share their latest research findings and new technology development, and looking into the future of HVAC.

Xi'an has more than 3,000 years of history as one of the four great ancient capitals of China. Xi'an has now re-emerged as one of the important cultural, industrial, and educational centers in China. History tells us a lot. The history of HVAC is much shorter. Addington (2001) wrote, after the 1918–1919 influenza pandemic, which killed more people than World War I, "*Engineers and manufacturers were quick to capitalize on the public's concern with cleanliness, and pointed out that the air handler could produce 'manufactured weather' that was cleaner and purer than what nature provided (Carrier 1919). In spite of the continued work of open-air enthusiasts such as Winslow and Dr. Leonard Hill during the next several decades to challenge mechanical systems, most of the early ventilation laws remained in place and the air-handler-based system became the standard for conditioning interior environments*." The new revitalization of natural ventilation and new development of mixed-mode ventilation in the past 10 years confirms the wisdom of Winslow and Dr. Leonard Hill.

The success of HVAC is and will also be judged in the balance of providing people a comfortable and healthy indoor environment and using the minimum resources and energy. The key to the success of HVAC is in understanding the human physiological needs in thermal comfort and healthy air, and the roles played by human behavior, which is dynamical in nature. We cannot just focus on the HVAC technologies as we have done in the past 100 years.

Urbanization is a huge thing in rapidly developing countries such as in China. More than 50 % of the world's population now lives in cities. The urban population will reach 1 billion by 2030 in China. In the next 10 years, it is expected at least 1 % of the population will become urban dwellers every year. The expectation for better indoor environment is also on the rise in China and other

developing countries as the living standard rises. Building consumes a large proportion of our energy in the world. Efficient HVAC is the key in high performance buildings. Continuing urban warming has been observed and studied in many megacities in the world. Just imagine if you are asked to cool the air in a Mong Kok district in Hong Kong or Wang Fu Jing Street in Beijing by a few degrees, what would you do? When shall we design a city just like designing a building? What can HVAC engineers and researchers help?

Xi'an literally means "Peaceful in the West" in Chinese, and it was historically known as Chang An ("Perpetually Peaceful"). We also wish that the world will not only be peaceful, but also sustainable. The HVAC Engineers and Researchers have a great role to play.

Finally, the conference organizing and the high quality of the proceedings are the result of many people's hard work, dedication, and support. The first appreciation goes to the Members of the International Scientific Committee. Great appreciation should also go to many people who worked tirelessly on the Organizing Committee. We greatly appreciate all the sponsors and cooperators for their special contributions.

We also express our thanks to the authors who enthusiastically presented their work, ideas, and results.

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