CONTENTS OF VOLUME 4

Solar and Low Energy Architecture

Thermal Comfort Requirements, Climate and Energy
The Reverend Michael A. Humphreys, Dunstable, Bedfordshire, UK 1725

Climate and Building Type: Applicability of Passive Cooling Systems
Prof. Baruch Givoni, School of Architecture, Los Angeles, California, U.S.A. 1735

The Importance of Daylight in Solar and Low Energy Architecture
Dr. Vic H.C. Crisp, Director of Env. and Energy Group, BRE, Watford, UK *

Global Climate Change and The Built Environment - Particularly Commercial Buildings
Mr. Graeme Robertson, School of Architecture, Property and Planning, University of Auckland, Auckland, New Zealand 1743

Cold Climates Sow the Seed for Understanding Buildings

The Solarium and The Courtyard as Modifiers in Mediterranean Venacular Architecture
D. Serghides, Energy and Environmental Studies, High Technical Institute, Cyprus 1752

Passive Solar Architecture in Greece
Mrs. C. Spiropoulou, School of Architecture, Athens, Greece 1765

Bioclimatic Buildings in South Italy, Operating with Central Control of Passive Solar Systems
M. Sala, L. Ceccherini Nelli, Dept. of Architectural Design, Univ. of Florence, Florence, Italy 1771

Composite Wall Storage-Collector Systems for Passive Utilization of Solar Energy in Cold Climates
Prof. E. Bilgen, Ecole Polytechnique, Univ. of Montreal, Montreal, Canada 1777

Does Every Courtyard Perform Well Climatically
Dr. S. Al-Azzawi, New Ash Green, Kent, UK 1787

What Makes a Courtyard Climatically Desirable
Dr. S. Al-Azzawi, New Ash Green, Kent, UK 1809

Daylight and Sunlight in Site Layout Planning
P.J. Littlefair, V.H.C. Crisp and M.E. Aizlewood, BRE, Watford, UK 1831

The Influence of The Residents Energy Behavior on the Thermal Balances of Low Energy Buildings
N. Chrisomallidou and A.M. Papadopoulos, Lab. of Buildings Const. and Physics, Fac. of Civil Eng., Thessaloniki, Greece 1843
Time and Thermal Comfort
J.F. Nicol, Oxford Polytechnic, School of Architecture, Oxford, UK

Comfort Assessment in a Naturally Ventilated Office
D.J. Croome, G. Gan and H.B. Awbi, Dept. of Construction Management,
Univ. of Reading, Reading, UK

Ozone Loopholes - A Case Study of Air-Conditioning in Britain
S. Roaf, The School of Architecture, Oxford Polytechnic, UK

The Solar Energy Programme of the UK Department of Trade and Industry
(Paper to be published in the Int. Jnl of Renewable Energy)
Adrian J. Cole, ETSU, Harwell, UK

Overheating and Daylighting in Commercial Buildings: The Case of Belgium
A. de Herde, M. Boisdenghien, E. Gratia, Architecture et Climat,
Univ. Catholique de Louvain, Louvain, Belgium

Direct Solar Floor Heating System: New Prospects
P. Papillon, B. Souyri, G. Achard, Lab. Genie Civil et Habitat,
Univ. de Savoie, Chambery Cedex, France

Thermal Performance of Dual Source Solar Heating System in Poland
D. Chwieduk, Inst. of Fundamental Tech. Research, Polish Academy of Sciences, Warszawa, Poland

Transparent Insulation in Various Solar Applications
E. Bollin, Fraunhofer Inst. for Solar Energy, Freiburg, Germany

Development of Domus Solar Homes in Germany
Gerhard W.P. Berndt, Passive Solar Architecture, D-2300 Kiel 14, West Germany

Innovative Glazing System: The Spotlight on Daylighting Provision
Paul J. Littlefair, V.H.C. Crisp and M.E. Aizlewood, BRE, Watford, UK

High - Energy - Efficiency in The Netherlands, The Evaluation of 6 Demonstration Projects
Sacha Silvester and Regina W. Hommes, Erasmus Centre for Env. Studies, Erasmus Univ., Rotterdam, The Netherlands

The Design of Zero - Zero Middleschool Building
Shi Yan and Fei Xun, Dept. of Architecture, Xian Institute of Metallurgy and Construction Eng., Xian, Shaanxi, P.R. China

Acceptance of Passive Solar Buildings by The End-User
Christos L. Tsapos, Dept. of Architecture and Building Sciences, Univ. of Strathclyde, Glasgow, UK

Permaculture and Neighbourhood Design
Mary Roslin, School of Architecture Studies, University of Sheffield
Controlling for Comfort in Sunspace Environments 1945  
A.C. Pitts and J. Patronis, School of Architectural Studies, Univ. of Sheffield, UK

Building Performance Prediction 1950  
Prof. Joseph Clarke, Dept. of Architecture, Univ. of Strathclyde, Glasgow, UK

A. Yezioro and Edna Shaviv, Faculty of Architecture, Technion, Haifa, Israel

Active Solar Technologies - A Growing Market 1972  
W.B. Gillett, and J.R. Stammers, Harcrow Gilbert Ass., Swindon, UK

Applicability of Passive Solar Heating in Regions with Hot Summers 1987  
B. Givoni

Experimental Study of Radiation - Natural Convection Interaction in an Enclosure at High Rayleigh Number 1993  
E.H. Cherkaoui and J.J. Vullierme, Lab. d'Energie et Therm.de l'Habitat, Toulouse, France

Radiative Cooling in Courtyards for Hot Dry Climates 1998  
Bruce Forwood and Saleh M. Al-fawaz, Dept. of Architecture and Design Studies, The University of Sydney, Australia

E. Akhniotis and A.K. Athienitis, Centre for Building Studies, Fac. of Eng. and Computer Science, Concordia Univ., West Montreal, Quebec, Canada

Glass with Super Thermal Insulation Properties 2008  
G. Ottmanns, VEGLA Research and Development Div., Aachen, Germany

Simulation of Solar - Induced Ventilation 2016  
H.B. Awbi, and G. Gan, Dept. of Const. Management and Eng., Reading University, UK

The Switching Behavior of Thermotropic (Chromic) and Nematic Materials for Solar Architecture 2031  
Prof. J. Fricke, Physikalisches Inst., Universitat Wurzburg, Wurzburg, Germany

Natural Ventilation in Buildings Due to Wind and Buoyancy 2039  
Forces an Integrated Approach  
E.H. Mathews and P.G. Rousseau, Centre for Exp. and Numerical Thermoflow, Univ. of Pretoria, Pretoria, South Africa

Comparative Assessment of Three Distributed Heat Storage Systems 2044  
J. Paris and Jean-Francois Houle, Ecole Polytechnique, L'Universite de Montreal, Montreal(Quebec), Canada

Future Saudi Arabian City Planning Based on Hydrogen 2049  
Distribution Network  
S.A. Alajlan and A.A.M. Sayigh, Mr. Saleh A. Alajlan, Department of Engineering, Univ. of Reading, Reading, UK
Energy Saving and Characteristics of Mud as a Building Material in Saudi Arabia
S.A. Alajlan and A.A.M. Sayigh, Department of Engineering, University of Reading, UK

The Effect of Turbulence on Entropy Generation in Passive Heating Systems
N. Egrican and S. Uygur, Istanbul Technical University, Mechanical Eng. Dept., Istanbul, Turkey

The Physical Properties of the Glass Used for The Solar Comfort
J. Pinter, Technical University of Budapest, Budapest, Hungary

An Analysis of Thermal and Optical Properties of the Heat Collecting Window with Single-Frame-Double-Layer-Glass
Li Baojun, and Liu Xiaoxi, Department of Physics, Shenyang Architectural Eng. College, Shenyang, P.R. China

Energy Transmitting Process of Solar Energy Lighting Through the Optical Waveguide Fibre
Li Baojun; and Zhang Kuichun, Dept. of Physics, Shenyang Architectural Eng. College, Shenyang, P.R. China.

Bioclimatic Design Studies for Passive and Low Energy Building Design in Hot-Dry/Semi-Arid Climates
G.S. Yakubu and S. Sharples, Department of Architecture, School of the Built Environment, The Polytechnic, Milton Keynes, UK

Effects of a Veranda on the Thermal Behavior of a Building With an Occupant
M.H.A.B. Larbi Youcef, A. Cordier, F. Monchoux, and F. Thellier, Haut Commissariat A La Recherche, Bouzareah, Alger, Algeria

Regional Energy Management of Railway Installations at Department Level, Phase I: Energetic Diagnose
F. Boccalaro, Italian State Railways, Genova, Italy

Prediction of the Parameters Affecting the Pressure Field Around Surface Mounted Bluff Bodies in 2D Turbulent Flow
B. Cuhadaroglu, T. Yavuz and T. Ayhan, K.T.U. Makina Muh Bolumu, Trabzon, Turkey

A Prospect on the Architecture of the 21st Centre in China
Xia Yun and Wang Jin, Department of Architecture, Xian Institute of Metallurgy and Const. Eng., Xian City, Shaanxi Province, P.R. China

Environmental-Energetic Modelling in Tourist Complex
J. Grabovac, Faculty of Civil Engineering, Univ. of Split, Split, Croatia (Hrvatska)

Monitoring and Comparative Thermal Analysis of a Passive Solar and a Conventional Apartment in Greece
Kostas D. Kotoulas, Agis M. Papadopoulos, Michael A. Papadopoulos, Aristotle Univ. of Thessaloniki, Sch. of Eng., Dept. of Civil Eng., Thessaloniki, Greece
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation of Passive Solar Systems under Economic and Energy-Saving Criteria</td>
<td>2120</td>
</tr>
<tr>
<td>N. Chrisomallidou, A.M. Papadopoulos, Gr. Economidis, Aristotle University of Thessaloniki, School of Eng., Thessaloniki, Greece</td>
<td></td>
</tr>
<tr>
<td>Estimation of Thermophysical Parameters under Transient Behavior</td>
<td>2125</td>
</tr>
<tr>
<td>B. Zimberg, Instituto de Fisica, Instituto de Quimica, Facultad de Ingenieria, Montavideo, Uruguay</td>
<td></td>
</tr>
<tr>
<td>Architectural Appraisal of Renewable Energy Research</td>
<td>2130</td>
</tr>
<tr>
<td>O. M. Banjoko, 9 Croydon House, Wootton Street, Waterloo, London, UK</td>
<td></td>
</tr>
<tr>
<td>Solar and Low Energy Architecture</td>
<td>2136</td>
</tr>
<tr>
<td>Ashok Joshi and D.K. Dixit, Rachana Architects, Dhanwate Ashram, Sitabuldi, Nagpur, India</td>
<td></td>
</tr>
<tr>
<td>Energy Saving Training in The Member States of The European Community</td>
<td>2140</td>
</tr>
<tr>
<td>A. Elagoz, Town and Regional Planning Dept., School of Arch., Mimar Sinan Univ., Istanbul, Turkey</td>
<td></td>
</tr>
<tr>
<td>Photovoltaic Energy for Ventilation &amp; Comfort</td>
<td>2146</td>
</tr>
<tr>
<td>R.S. Abro and A.C. Pitts, School of Architectural Studies, University of Sheffield, Sheffield, UK</td>
<td></td>
</tr>
<tr>
<td>Educating Architects in the Age of the Greenhouse</td>
<td>2151</td>
</tr>
<tr>
<td>Bruce Forwood, Dept. of Architecture and Design Science, Univ. of Sydney, Sydney, Australia</td>
<td></td>
</tr>
<tr>
<td>A Sunspace Phototype Elementary Rural School for the Sub-Andean Region in Argentina</td>
<td>2156</td>
</tr>
<tr>
<td>A. Canton, C. de Rosa, A. Esteves, A. Pattini, and M. Basso, Laboratorio de Ambiente Humano y Vivienda (LAHV), Centro Regional de Investigaciones Cientificas y Tecnologicas, CCRICYT), Mendoza, Argentina</td>
<td></td>
</tr>
<tr>
<td>The Architecture and Thermal Performance of Modern and Traditional Housing in the Desert Town of El-Oued, Algeria</td>
<td>2161</td>
</tr>
<tr>
<td>F. Bourbia, Constantine, Algeria</td>
<td></td>
</tr>
<tr>
<td>Consideration in different applications of evaporative cooling systems in Architecture</td>
<td>2166</td>
</tr>
<tr>
<td>Validation of A Design Tool for Low Energy Architecture</td>
<td>2171</td>
</tr>
<tr>
<td>E.H. Mathews, A.G. Shuttleworth and G.B. Hanna, CENT, Faculty of Eng., Univ. of Pretoria, Pretoria, South Africa</td>
<td></td>
</tr>
<tr>
<td>Heat Transfer in Trombe Wall Using Two-Dimensional Model</td>
<td>2176</td>
</tr>
<tr>
<td>W. Smolec and A. Thomas, Instrumentation and Service Unit, Indian Institute of Science, Bangalore, India</td>
<td></td>
</tr>
<tr>
<td>Towards a Self-Sufficient Architecture</td>
<td>2181</td>
</tr>
<tr>
<td>Paul J. McGrath, High Street, Oakley, Bedford, UK</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Author(s)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Calculation of Heat Transfer Through a Massive Slab-on-Grade Floor</td>
<td>A. Abdelbaki and Z. Zrikem</td>
</tr>
<tr>
<td>Numerical Calculation of Two-Dimensional Forced, Mixed and Natural Convection in a Square Open Cavity</td>
<td>T. El Gouti and A. Mir</td>
</tr>
<tr>
<td>Bioclimatic Rural Houses</td>
<td>Mascaro</td>
</tr>
<tr>
<td>Utilization of Solar Energy for Beton Treatment</td>
<td>Trinh Xuan Minh, and Vu Doan Mien</td>
</tr>
<tr>
<td>Passive System for Heating in Winter and Cooling in Summer</td>
<td>C. Abid, M.H. Adiali and R.S. Chaffai</td>
</tr>
<tr>
<td>One Year Experiences with a Solar Building with Transparently Insulated Walls in Shanghai, P.R. China.</td>
<td>E. Bollin, Qian Shang Yaun, Ling Zhi Guang, Liang Zhong Wei</td>
</tr>
<tr>
<td>Fresnel Lenses and Plastic Optical Fibers for Natural Lighting of Interior Rooms in Old Buildings.</td>
<td>M. Sala, L. Ceccherini Nelli, and F. Milanesi</td>
</tr>
<tr>
<td>Window Orientation for Reduced Cooling and Heating Loads in Iran</td>
<td>M. Taheri, M.A. Yaghoubi, M. Monabbati, and G. Karimi</td>
</tr>
<tr>
<td>An Environmentally Friendly System for Heating and Cooling Applications</td>
<td>S.B.Riffat &amp; N.J.Shankland</td>
</tr>
</tbody>
</table>
Video and Computer Aided Optimization of the Solar Radiation in Urban Environment
S. Medved, P. Gricar, and P. Novak, Faculty of Mechanical Engineering, University of Ljubljana Ljubljana, Murnikova 2, Slovenia

Thermal Behaviour of Buildings in the Nigerian Sudan Savannah During the Harmattan Season
S.U. Egarievwe and B.A.L. Gwandu, Laboratory Coordinator, Usmanu Danfodiya University, Faculty of Science, Sokoto, Nigeria

Victor Olaniyi, Division of Building Services Eng., Hertfordshire Centre for Building Studies, St. Albans, UK

Local Energy Implications in Town Planning
A. Elagoz, Town and Regional Planning Dept., School of Arch., Mimar Sinan Univ., Istanbul, Turkey

Investigating the Thermal Responses of the Contemporary Villa Type Houses of Saudi Arabia
A.A. Zuhairy and A.A.M. Sayigh, Dept. of Eng., Univ. of Reading, Reading, UK

Energycourt - The Energy - Controlled System
S.A.A. Al-Awadhi and A.A.M. Sayigh, Dept. of Eng., Univ. of Reading, Reading, UK

* Papers were not received in time to be included in the proceeding.