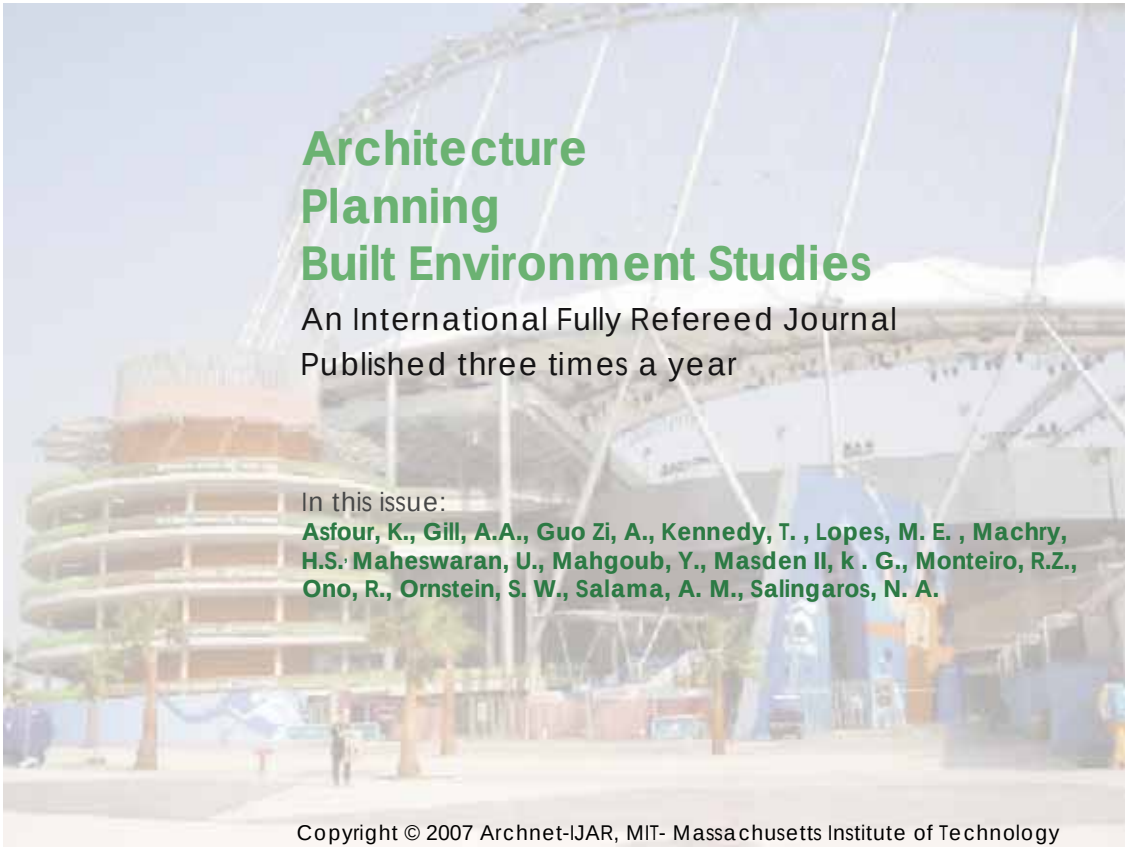
ArchNet IJAR

International Journal of Architectural Research

Volume (1) - Issue (1) - March 2007



Architecture
Planning
Built Environment Studies

An International Fully Refereed Journal
Published three times a year

In this issue:

Archnet-IJAR is published and archived by ARCHNET, the most comprehensive online community for architects, planners, urban designers, interior designers, landscape architects, and scholars working in these fields, developed at the MIT School of Architecture and Planning in close cooperation with, and with the full support of The Aga Khan Trust for Culture, an agency of the Aga Khan Development Network.

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Archnet- IJAR

ArchNet International Journal of Architectural Research – Archnet-IJAR is the first of its kind; an interdisciplinary comprehensive scholarly journal of architecture, planning, and built environment studies, that is blind reviewed and published on the World Wide Web three times a year.

Objectives

Archnet-IJAR objective is to establish a bridge between theory and practice in the fields of architectural and design research, and urban planning and built environment studies. It reports on the latest research findings and innovative approaches for creating responsive environments, with special focus on architecture and planning in developing countries.

Archnet-IJAR is truly international and aims at strengthening ties between scholars from different parts of the world with contributors and readers reaching across geography, boundaries, and cultures.

Archnet-IJAR articles come from architects, interior designers, planners, and landscape architects, and from those working in these fields in academic institutions, universities, research centers, government agencies, and private practice.

Reader

Archnet-IJAR addresses academics, practitioners, and students of archi-tecture, planning and interior design. It addresses those who are interested in developing their understanding and enhancing their knowledge about how environments are designed, created, and used in physical, social, cultural, economic, and aesthetic terms. Archnet-IJAR content keeps readers up-to-date on the latest ideas, designs, and developments in built environment related fields.

Archnet-JAR publishes research studies, criticisms and evaluation studies, and critical analyses about the creation, use, and evaluation of different types of environments at the macro and micro scales. The journal includes original empirical research papers, analytical case studies, and high quality position papers. Three major areas are covered by Archnet-IJAR:

Architectural and Design Research:

Topics include –but not limited to: architectural pedagogy and design studio teaching practices; architectural technology and sustainable design; design methods and architectural theories; design and project programming; environment-behavior studies; information technology; Islamic architecture; computer applications and virtual environments; post occupancy and facility performance evaluation; and social and cultural factors in design.

Urban and Built Environment Studies:

Topics include --but not limited to: administrative and political factors contributing to the shaping of communities, cities and urban regions, community planning; sustainable urban conservation; environmental planning and eco

development; housing policy, planning, and design; new urbanism; sustainable development; space syntax and GIS applications; and way-finding and signage systems.

Critical Essays on Architectural and Planning Projects:

Essays that cover the above topics; critically discussing projects in use; after they have been designed, built and occupied. Articles are preferred to utilize the case study approach as a critical method in built environment research.

Advisory and Editorial Boards

The Chief Editor is in charge of developing journal issues, seeking out resources and articles, establishing publishing strategies, coordinating the review process, and posting each issue and its articles online. Archnet-IJAR has two boards; advisory and editorial. The range of expertise of the boards that include the panel of referees –academics and professionals-- ensures high quality scholarly papers and allows for a comprehensive academic review of contributions that span wide spectrum of issues, methods, theoretical approaches, and professional practice.

Submission Process

Unlike other printed Journals where contributors wait for periods that reach two or three years for their work to get published, the value of Archnet-IJAR as an online journal is that it eliminates the large lead time needed for publication. However, submission, referee, and publishing processes are strict and adhere to the following procedures:

Interested contributors contact the chief editor expressing interest, and submitting a summary of their paper. One page will do.

The chief editor consults with the advisory and editorial board members according to their relevant expertise.

Soon after receiving feedback from the referees, author(s) are contacted to submit their full papers.

When full papers are received, they will be forwarded to two editorial board members for blind review, according to the referee form.

The chief editor contacts the author(s) with the referee form filled by the reviewers. While papers will be blind reviewed, in exceptional cases author(s) will be asked to communicate directly with the reviewers.

Author(s) revise their papers as noted by the reviewers and re-submit their work to the chief editor.

Author(s) should make sure that their submissions should be free of jargon, clear, simple and to the point.

Papers will be published in the next issue according to the following schedule:

March 30th (publishing date): December 15th (deadline to receive papers after reviews)
July 30th (publishing date): April 15th (deadline to receive papers after reviews)
November 30th (publishing date): August 15th (deadline to receive papers after reviews)

Interested reviewers and members of the advisory board may submit their work for publication in Archnet-IJAR. Their work will go

through the same blind review process and will follow the preceding procedures.

Notes to Contributors

1. Submission of Manuscripts

The language of the journal is English. All submissions will be online. One copy of the manuscript (in word document format) together with original figures and tables must be submitted to the editor: Ashraf Salama ijar@mit.edu

The name, mailing address, position, affiliation, telephone, fax, and email of each author must be supplied in a cover letter attached to an email. All papers will be blind reviewed and assessed by at least two referees.

2. Preparation of Manuscripts

Layout

Manuscripts should be typed in double spacing on one side of A4 (21x29.7 cm) paper with reasonable margins (2.5 cm). All pages should be numbered consecutively.

Title page (page 1)

The first page of the manuscript must contain a concise and informative title; names, affiliations and addresses (including e-mail) of all authors, and identify the corresponding author (who will be responsible for correspondence and reviewing proofs). An abbreviated title of less than 50 characters (including letters and spaces) should also be suggested.

Title of paper, abstract and keywords (page 2)

Title of the paper should be witten at the top of abstract without authors' name. A concise and informative abstract must not exceed 300 words in length, should summarize the objective, methods and major findings of the paper. Keywords must be carefully selected to facilitate the readers' search on Archnet Website, and should not exceed 5 key words.

Articles

Articles should not exceed 6000 words, including references.

Notes

Avoid the use of footnotes and endnotes, if unavoidable, label as (1), (2) and list all together at the end of the paper.

References

References in the text should give the surname of the author and the year of publication in brackets, for example, Rowe (1985) or (Rowe, 1985), followed by a, b,...when two or more references to work by one author are given for the same year. Page numbers should be given for quotes (Mitchell, 2003:33). At the end of the text the references should be listed in alphabetical order of authors' names and in chronological order for each author. Initial and final page numbers of articles and papers should be given. The names of books and periodicals should be given in full, and the publisher and the city of publication should be given for books, conference proceedings, etc. Details of availability should be given for unpublished conference papers. Full references should also be given for legal judgments, bylaws and regulations, and government publications, etc. Examples of reference citation are given below.

Dutton, T.A. (Ed.). (1991). Voices in Architectural Education: Cultural Politics and Pedagogy, Bergin & Garvey, New York, NY, USA.

Hegvold, L. (1999). "Seeking an Effective Cross-Cultural Design Pedagogy." In William O'Reilly (Ed.), Architectural Knowledge and Cultural Diversity,

Comportments, Lausanne, Switzerland, pp. 93-100.

Salama, A. (1998). "Integrating Environment-Behavior Studies into Architectural Education Teaching Practices," In J. Teklenburg, J. Van Andel, J. Smeets, & A. Seidel (Eds.), Shifting Balances: Changing Roles in Policy, Research, and Design, EIRSS Publishers, Eindhoven, Netherlands, pp.128-139.

Salama, A. (2006). "Learning from the Environment: Evaluation Research and Experience Based Architectural Pedagogy," Transactions, CEBE-Center for Education in the Built Environment, Cardiff, UK, 3 (1), pp. 64-83.

Salama, A., O'Reilly, W. & Nochis, K. (Eds.). (2002). Architectural Education Today: Cross Cultural Perspectives, Comportments, Lausanne, Switzerland.

Sanoff, H. (1992). Integrating Programming, Evaluation, and Participation in Design, Avery, London, UK.

Tables

Each table must be typed, and con-secutively numbered. They should have a brief informative title placed as a heading. Tables should be understand-able without reference to the text, but they should be referred to in the text. Explanatory captions should be brief and placed beneath the table.

Figures

Figures should be numbered consecuti-
- vely throughout the paper and identified with the authors' name and the figure number outside the reproduction area. Figures should be referred to in the text and should be placed within the body of the paper. However, all figures should be supplied in separate files as JPEG file format. Figure dimensions should not exceed 21x30 cm. Photographs should be used with restraint and must be of high quality. Explanatory captions should be brief, placed beneath the figure.

3. Submission Process, Copyright, and Originality of Work

Proofs will be sent to the corresponding author for checking. Proofs should be returned within one week of receipt. Authors should correct typesetting errors only; they should not add any new material to the paper at proof stage.

Please read the submission process and procedures, and copyright notes under the general outline of the ARCHNET-IJAR.

All correspondence should be addressed to the chief editor.

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Ashraf Salama holds B.Sc., M.Sc. and Ph.D. degrees in Architecture. He is Professor of Architecture currently teaching at Qatar University, taught at KFUPM (2004-06), and was the Director of Consulting at Adams Group Architects in Charlotte, North Carolina, USA (2001-04). He is licensed architect in Egypt received his training at Al Azhar University in Egypt and North Carolina State University, Raleigh, USA. Salama chaired the Department of Architecture, Misr International University in Cairo (1996-01). He has published numerous papers in international conferences and archival journals and magazines. He authored and co-edited four books on Architectural Education: Designing the Design Studio (USA), Human Factors in Environmental Design (Egypt), Architectural Education Today (Switzerland), and Architecture as Language of Peace (Italy). Salama was the recipient of the first award of the International Architecture Design Studio, University of Montreal, Canada, 1990, and in 1998 he won the UIA Paul Chemetove Prize, France. He is member of scientific boards of several intl. journals.

Sheila Walbe Ornstein

Sheila Walbe Ornstein received her Ph.D in 1988 in architecture and urbanism She is full professor of the Faculty of Architecture and Urbanism at the University of São Paulo (FAUUSP), Brazil and researcher of the National Council of Scientific and Technological Development (CNPq). She was the vice-dean of FAUUSP from 1998 to 2002. Her research, teaching and professional interests include Post-Occupancy Evaluation (POE), Quality Design Management and Construction Technology. Dr Ornstein is a co-author of "Assessing Building Performance" (Elsevier, 2005) edited by W.F.E Preiser and J.C. Vischer.

Rosaria Ono

Rosaria Ono is architect and urbanist, has a master degree in Engineering at the Nagoya University (1991) and a Ph.D in architecture and urbanism of the Faculty of Architecture and Urbanism at the University of São Paulo (FAUUSP), Brazil (1997). She worked at the State of São Paulo Institute of Technological Researches (IPT) from 1991 to 2003 and is currently lecturing at the FAUUSP. Her teaching, research and consulting work includes Fire Safety, Post-Occupancy Evaluation (POE) and procedures for architecture professional practices. She has been the leader of several research projects focused on fire safety and its relationship with architecture and urban design and sponsored by relevant Brazilian agencies like Studies and Projects Sponsorship (FINEP) and Foundation for the Research Support of the State of São Paulo (FAPESP).

Maria Elisabete Lopes

Dr. Lopes holds a diploma of architecture and also received a doctorate in architecture and urbanism in 2005 from the Faculty of Architecture and Urbanism at the University of São Paulo (FAUUSP), Brazil. She is member of the São Paulo Municipality staff . Recently, she was commissioned at the University of São Paulo (USP) in order to adapt all USP Campi (the countryside and the São Paulo State capital ones) for reduced mobility people.

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Dr. Lopes also takes part of the Brazilian Association for Technical Norms (ABNT) which developed and updated accessibility technical standards. Her research, professional and teaching interests include Accessibility, Universal Design and Post-Occupancy Evaluation (POE).

Uma Maheswaran

Uma Maheswaran is currently a visiting fellow at the department of architecture, National University of Singapore. He works in the areas related to total building performance and in specific in relation to energy related issues in Buildings.

Ang Guo zi

Ang Guo zi is a graduate student in the department of architecture pursuing her Masters in Architecture in the Design Technology and Management track at the National University of Singapore.

Nikos A. Salingaros

Nikos A. Salingaros M.A., Ph.D., ICTP, ICoH is the author of "Anti-Architecture and Deconstruction" (2004), "Principles of Urban Structure" (2005), and "A Theory of Architecture" (2006), as well as numerous scientific papers. Both an artist and scientist, he is Professor of Mathematics at the University of Texas at San Antonio, and is also on the architecture faculties of universities in Holland, Italy, and Mexico. His work underpins and helps to link new movements in architecture and urbanism, such as New Urbanism, the Network City, Biophilic Design, Self-built Housing, and Sustainable Architecture. Dr. Salingaros collaborated with Christopher Alexander, helping to edit the four-volume "The Nature of Order" during its twenty-five-year gestation. In recognition of his efforts to understand architecture using scientific thinking, he was awarded the first grant ever for research on architecture by the *Alfred P. Sloan Foundation*, in 1997. Dr. Salingaros is a member of the *INTBAU College of Traditional Practitioners*, and is on the *INTBAU Committee of Honor*.

Kenneth G. Masden Ii

Kenneth G. Masden II received his B.Arch. from the University of Kentucky in 1982 and his M.Arch. from Yale University in 2001. While at Yale University he studied directly with Léon Krier, Fred Koetter, Andrés Duany, and Vincent Scully. Also during this time he worked for Peter Eisenman as the project architect on the Memorial to the Murdered Jews of Europe in Berlin, and as a project consultant on the Cidade da Cultura de Galicia (Center of Culture) in Santiago, Spain. His work spans from the design-build of custom homes, to Community Design work on Federal HUD Urban Renewal and Housing Projects, to large-scale base relocation and land reclamation projects for the U.S. Military, totaling nearly $4 billion in projects, which he has designed or managed in Japan, Germany, Spain, Italy, and America. Now an Associate Professor of Architecture at the University of Texas at San Antonio, his research is influenced by his international experience underpinning his investigations into urban form.

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Dr. Masden's writings and work look specifically at the adaptive and culturally-driven urban systems that imbue the built environment with life.

Khaled Asfour

As an architecture student he acquired his practical training in Siemens-Munich office and upon graduation he worked as an interim architect in DLC Milan. His early exposure to European practice made him aware of different design mentality compared back home. At the age of 31 he completed PhD, specializing in history, theory and criticism of architecture Massachusetts Institute of Technology. In next seven years, he taught in King Faisal University of Saudi Arabia, and traveled in Gulf, Middle East and North Africa searching for architectura excellence in the Arab world. He wrote intensively on the subject which qualified him to became the regional editor responsible for all Arab entries in Dizionario della' architettura del XX secolo published in Turin. He was then selected to be a research fellow at Harvard University, Graduate School of Design. He sat on international juries in American University of Sharja, Bahrain University, and Riyadh Development Authorities. He was one time a technical reviewer for Aga Khan Award for Architecture. Recently, he was invited to join a research group working on Architecture and Identity organized by Berlin Technical University. Since 2000 years he is teaching in Misr International University in Cairo.

Yasser Mahgoub

Dr. Yasser Mahgoub, Assistant Professor of Architecture, Department of Architecture, College of Engineering and Petroleum, Kuwait University. Received Doctorate in Architecture degree from The University of Michigan, Ann Arbor, USA in 1990. Taught at Ain Shams University, Cairo, Egypt from 1990 to 1993, at United Arab Emirates University, Al Ain, UAE from 1993 to 1999, and at Kuwait University from 1999 to date. Research interests include social and cultural aspects of architecture, sustainable architecture, architectural education and the impact of globalization on architecture. Teaches architectural design studios, human environmental factors, and architectural professional practice courses. Practiced architecture in Egypt and is currently a consultant for Kuwait University Vice President for Planning for the New University City Campus Master Planning.

Thalia Kennedy

Thalia Kennedy is a researcher, lecturer and teacher. She recently completed her PhD at the School of Oriental and African Studies in London in which she explored the social, political and historical aspects of sultanate architecture in South Asia. Her knowledge includes aspects of the art and architecture of Europe, the Middle East and South Asia. Thalia 's current research interests are the architecture of Muslim societies and the importance of cultural heritage in societies affected by conflict, civil unrest and natural disaster. Thalia is currently a Visiting Lecturer and Tutor at the Institute of Ismaili Studies, the Victoria & Albert Museum and Sotheby's Institute in London. She has worked as writer and editor for on-line resources focused on South Asian art and architecture, and has presented her research at an international level.

EDITORIAL: ARCHNET-IJAR IS SETTING THE STAGE FOR ONLINE PUBLISHING IN ARCHITECTURAL AND BUILT ENVIRONMENT RESEARCH

Ashraf M. Salama

It was a long time and a long road since the idea of a comprehensive online journal in architectural research and criticism was discussed. While it took sometime, one tends to believe that the best things are wroth waiting for. The idea of IJAR-The International Journal of Architectural Research- goes back to late 1999 when Shiraz Allibhai was responsible for coordinating the efforts of developing an online community for architects, scholars, and students of Architecture – "ArchNet".

ArchNet is as an international online community developed at the MIT School of Architecture and Planning and the University of Texas at Austin, School of Architecture, in close cooperation with, and with the full support of The Aga Khan Trust for Culture-AKTC, an agency of the Aga Khan Development Network. Throughout the years, ArchNet became a growing global community of scholars, students, and professionals concerned with architecture, planning, and landscape design. ArchNet provides them with A) comprehensive architectural resources, B) new perspectives on the built environment, and C) insights into Islamic design and culture.

The issue of consumption of knowledge and versus production of knowledge within the developing and Islamic worlds was always a subject of debate and discussion in different seminars organized by the AKTC. In addition to having digital resources on ArchNet, I was particularly interested in a vision that a high quality refereed online journal developed within ArchNet would complement various modules, invigorate the community efforts, and enhance the bringing of a community of educators, practitioners and scholars in the broad subject area of "Architectural Criticism and Built Environment Research." IJAR is a welcome addition of ArchNet's magnificent resources.

The development of IJAR-The International Journal of Architectural Research is based on the belief that e-journals offer readers a particular ease of access. They can readily work across different journals, find exactly where certain ideas are being discussed, or move readily from citation to source. They find something that serves their needs, copy the article's bibliographic reference, and perhaps a quote or two. They press Print, or Save if it's

a keeper, and they move on. Free and open access is what IJAR is adopting where the success of the open access publishing model is bound to have a profound impact on the state of knowledge as this depends on the extent of its circulation and exchange.

Time and the future issues of IJAR will tell the international planning, architectural, and design communities what contributions IJAR can make. However, the editorial team is already by both the number of papers being submitted and the quality of research and discussion they encompass. As part of delivering ArchNet's mission, IJAR will be a mechanism by which the international community of architects, planners, and designers, and those who are working in related disciplines are engaged in research in research and reflection of their practice and debating issues of concerns to their social, cultural, physical contexts.

IJAR will be a major source and will provide an international forum for discussion and debate, learning, and scholarship issues. It acts as a means for disseminating knowledge and findings of well founded academic investigations as well as intellectual critical arguments on the current status of architecture. It is the hope that IJAR becomes one of the principal international homes for refereed articles on "Architectural and Built Environment Research."

In this inaugural issue of IJAR, there are seven highly interesting and diverse papers. Two papers of place emphasis on the technical aspects of the built environment including accessibility, fire safety, day-lighting, and energy performance; one paper introduces a new position on the role of human intelligence in shaping the architecture of the 21st century; three papers offer critical analyses of the built environment of the Arab world debating issues that pertain to tradition, modernity, and identity; and one paper explores the notion of hierarchy in Taj Mahal's interior spatial environment.

The paper of Sheila Walbe Ornstein, Rosaria Ono, and their colleagues addresses fire safety and accessibility issues in hospital environments by describing and analyzing the procedures and findings of post occupancy evaluation. Their case was the Orthopedics and Traumatology Institute (IOT) of the General Hospital (Hospital das Clínicas) of the University of São Paulo(USP), Brazil. Involving graduate students and faculty the study consisted of the application of various methods for evaluating performance in use and the final results were organized in a concise, user-friendly manner in discovery maps that bring together synthesis of the different evaluation standards including opinions of users and appraisal specialists, the pertinent legislation, and recommendations for each critical point by floor and by sector. These were intended as an aid for decision makers when introducing interventions, remodeling, or expansion projects.

Uma Maheswaran and Ang Guo zi investigate condominiums as an important typology of housing in Singapore. They address the factors of day-lighting and energy performance as important determining factors in the design of condominiums. A thorough case study of one such condominium development is introduced and the results obtained through this pilot study are used to analyze the trends across prototype units using simulation tools. The results show that

the residents of such units pay a very high rate for electricity resulting from air conditioning the habitable spaces in their residence. Their paper is a conscious attempt to discuss a few examples of condominiums around the western part of Singapore as a means of debating the emerging design trends and the performance aspects of the design solutions in terms of day lighting and energy consumption.

Salingaros and Masden introduce a critical and thought provoking argument on a newnew way of thinking about, teaching, and practicing architecture. Founded on the basis of how the human mind perceives and interacts with the built environment, their paper calls this new design process "intelligent architecture". They argue that scientifically-conceived rules for architectural design and building can lead to a more human architecture, one with a renewed respect for traditional methods of architectural design. They recommend that by applying the most recent scientific advances to architectural thinking, we can better appreciate the architectural heritage of the past, giving scientific insight into its origins and manner of conception.

The papers of Asfour, Mahgoub, and Salama share common concerns. Khaled Asfour argues, and rightly so, that there is a great divide between academic field and professional practice. He introduces the thought that in Arab countries academics are advocating traditional architecture in a "traditional" way. They believe in image cloning and visual abstraction from history, but because of rising competition, architects in the market are giving what the society aspires for: modern architecture. Criticizing academics Asfour states that this polemical practice has not yet penetrated the thick skin of academics. He sheds light on established and emerging trends on architectural practices in the Arab world.

Yasser Mahgoub discusses the mutual relationship between cultural identity and the built environment. He introduces a number of critical questions that pertain to such a relationship: what aspects of cultural identity change and how do they impact architecture and the built environment? And, in return, what aspects of architecture and the built environment change and how do they impact cultural identity? In an attempt to answer these questions Mahgoub's work focuses on Kuwait as a case study. It starts by analyzing the cultural transformation that occurred in Kuwait during the 20th century under influences of economic and global changes, and then examines recent attempts at the beginning of the 21st century to reflect a cultural identity in architecture. He recommends that when searching for cultural identity, one should expect be find several overlapping identities. Mahgoub calls for a more open-ended approach to be adopted when studying cultural identities; an approach that stresses the *hybrid* and *hyper* nature of culture identity; a hyper-identity.

Ashraf Salama introduces an argument with cases on the issue of identity, tradition, modernity, and the underlying ISMS and trends in contemporary architecture of Egypt. Based on his earlier work His argument presents a new positional interpretation of contemporary Egyptian architecture. It calls for a fresh look at the issue of meaning in architecture by critically analyzing the current status of architecture in Egypt through a reading of trends that emerged

over the fifteen years. Debating the concepts of Mediterraneanism and Middle Easternism in association with the situation of architecture and urbanism in Egypt, Salama identifies and critically analyzes a number of ISMS including postmodernism, historical revivalism, critical regionalism and confusing symbolism. His work concludes by outlining an approach for a deeper insight toward the understanding of meaning in Egyptian architecture.

Thalia Kennedy explores the notion of hierarchy in architectural design and decoration with specific reference to the Taj Mahal complex in Agra, dating to 1632 onwards. As one of the acknowledged architectural masterpieces of the world, addressing the concepts that lie behind the design of the Taj Mahal allows an understanding of that achievement beyond its immediate visual impact. Much research has been carried out on various aspects of this Mughal tomb complex. However, Thalia's work focuses on the notion of hierarchy that informs the design of the inlaid decorative programme in the zone immediately surrounding the tombs of the deceased. This zone of decoration was particularly highlighted by Mughal commentators for its opulence and accomplished craftsmanship and remains today a highlight for visitors to the mausoleum. The work addresses three main issues: the decorative technique and its context and symbolism; a description of the gemstone and ornamental stone programme with a focus on motif, material and location; and the relationship between that programme and the concept of hierarchical organisation in its enhancement of the visual and spatial effects.

This is an eclectic mix of for a first edition and one which gets IJAR off to an excellent start.

We wish to have more papers in our system so that debate continues. It is expected that there will be three editions per year and special editions on pressing issues.

I would like to thank the advisory board for contributing and taking part in this project. Thanks are due to my colleagues and friends of the scientific board for their support and encouragement, and for their efforts in reviewing the papers of this first edition.

Ashraf Salama
IJAR Editor

HEALTH CARE ARCHITECTURE IN SÃO PAULO, BRAZIL: EVALUATING ACCESSIBILITY AND FIRE SAFETY IN LARGE HOSPITALS

Sheila Walbe Ornstein, Rosaria Ono, Maria Elisabete Lopes, Monteiro, R.Z., Gill, A.A., and Machry, H.S.

Abstract

This article describes and discusses procedures of scientific and technical interest for applying the Post Occupancy Evaluation (POE), especially certain questions related to accessibility and fire safety in specialized and complex hospital buildings. For this purpose, the building occupied by the Orthopedics and Traumatology Institute (IOT) of the General Hospital (Hospital das Clínicas) of the University of São Paulo(USP), Brazil was chosen, as this institute is one of the most important health centers in Latin America in its specialty. With approximately 25,000m^2 distributed throughout nine floors, the IOT offers services of a public nature to about 1,000,000 patients each year. Approximately 200 physicians and 890 nurses work in this building. The research described here was carried out in 2005 and involved teachers and graduate students of the Faculty of Architecture and Urbanism of the same University of São Paulo. The work consisted of the application of various methods for evaluating performance in use and the final results were organized in a concise, user-friendly way in discovery maps. These maps, which bring together synthesis of the different evaluation standards regarding the building (opinions of users and appraisal specialists, the pertinent legislation, and recommendations for each critical point by floor and by sector), are a valuable tool for decision-making by the building's managers in terms of interventions, remodeling projects, expansion and the implementation of improvements.

Keywords

Post-occupancy evaluation; large hospital facilities; Brazilian health care architecture; accessibility; fire safety.

Introduction

Post Occupancy Evaluation of Hospitals in Brazil

Although the POE has been used in academic circles in Brazil since 1984 (Roméro; Ornstein, 2003), only in the 1990s did research in the field of performance evaluation begin, more specifically in relation to POEs focused on hospital buildings. Especially important in this process were studies published by Preiser (1998) on hospital systems in the USA, Europe and Israel. Preiser, an architect (Preiser; Vischer, 2005), and Bechtel (1997), an environmental psychologist, introduced the concept of inter-disciplinarity between architecture and urbanism and other subjects, and the need to include users' perceptions in research on built environments. Architects should be concerned not only with the health of buildings, but also, and especially, with the physical and mental health of the people who occupy them. The difficulties in applying the

POE to highly complex buildings in Brazil, such as hospitals, resulted in the delay of research in this field. In addition, difficulties arose in accessing institutions of this type, especially in the case of private hospitals. One reason for this obstacle is the stress that *in loco* research can cause in environments of this nature and also because of the implications of the negative aspects which might be found.

For these reasons, few M.A.'s dissertations and Doctoral theses based on the POE applied to hospitals have been concluded, and few other studies have been published in this area by schools of architecture and urbanism in Brazil. Those that have appeared are basically concerned with flows and circulation (Kotaka; Fávero, 1998), sustainability, environmental comfort, and functional aspects in general ((Visconti, 1999); (Del Rio; Ornstein; Rheingantz, 1998); (Cavalcanti, 2002); (Sampaio, 2006)). The report by Kohlsdorf (1995) might also be mentioned here, as it provides an important analysis of the morphological performance of hospital buildings on the basis of performance evaluation. In addition, it takes into account the potentials of orientations, identification and the capacity for stimulus which this type of architecture induces in people. More recently, Castro, Lacerda and Penna (2004) made advances in the systematic application of POE tools in buildings related to health care on the campus of the Oswaldo Cruz Foundation (Fiocruz) in Rio of Janeiro, including demonstrations of a diagnosis resulting from the use of so-called discovery maps, described by Zeisel (2006) and by a group of researchers in the Graduate Program in Architecture (ProArq) of the Faculty of Architecture and Urbanism of the Federal University in Rio of Janeiro (FAU-UFRJ), coordinated by Dr. Paulo Afonso Rheingantz. With the experiences of ProArq-FAU-UFRJ, Fiocruz became the first large institution in the field of research, education and treatment in public health to bring together an in-house technical team in POE to provide information regarding interventions and guidelines for new building designs, based on procedures for managing environmental quality. Also, in the 1990s a few large Brazilian cities came out with specific guidelines for hospital designs. The city of Rio de Janeiro, the second large Brazilian urban environment, was one of them.

In this regard, the POE applied to the Orthopedics and Traumatology Institute of the General Hospital is of special significance, not only because of the importance of this public institution as a teaching hospital and the service it provides to the population, but also because the study consists of a virtually unprecedented POE, focused on questions of accessibility and fire safety. For this study the authors sought to use multi-method and multi-technique approaches aimed at guaranteeing the reliability of the entire research process. The result was a floor-by-floor discovery map that synthesizes the opinions of users and specialists, diagnoses, laws and regulations, and pertinent proposals for solutions whenever appropriate.

Accessibility and Fire Safety

In Brazil, as well as in other places in the world, accessibility – meaning the existence of democratic venues that can be made use of by anyone, regardless of any physical, sensorial or cognitive limitations – consists of a process that is implemented in a sequence of stages. The process begins with the perception of the need to ensure social inclusion, followed by decisions to put it into practice. Next, specific

social measures must be taken based on the realization that it is essential to structure a legal framework that emphasizes equal opportunities. The process should also include other less theoretical aspects concerning the various technical areas.

Over the years, this set of measures and processes gradually took shape through a series of international guidelines that inspired specific legislation in different countries. In Brazil, the first technical standards on accessibility in buildings and spaces of public use, called NBR 9050, arose in 1985 and were revised in 1994 and 2004.

Fire safety is a topic that has been studied since the early 20th century and has gone through considerable scientific development since then, especially as a consequence of major losses caused by occasional but disastrous fires. In Brazil, the first most significant measures were taken only in the mid-1970s, after the occurrence of two major fires in high-rise buildings in the city of São Paulo. It can still be said today that the laws and regulations currently in effect, which set down the minimum conditions of fire safety in the country, are scarce and often ineffective.

In addition, the lack of knowledge and concern among users of buildings makes the problem worse, because it results in deficiencies generated by the lack of maintenance of the protection equipment that is already in place and by the lack of preparation of the public to face emergency situations.

In the last two decades, a number of technical and normative documents have been published in relation to both accessibility and fire safety. Academic work has also played an important role in publicizing these areas of knowledge, providing information to architecture and engineering professionals at least partially bridging the gap caused by the failure to treat such topics in Brazilian schools of architecture.

The Case Study

Description

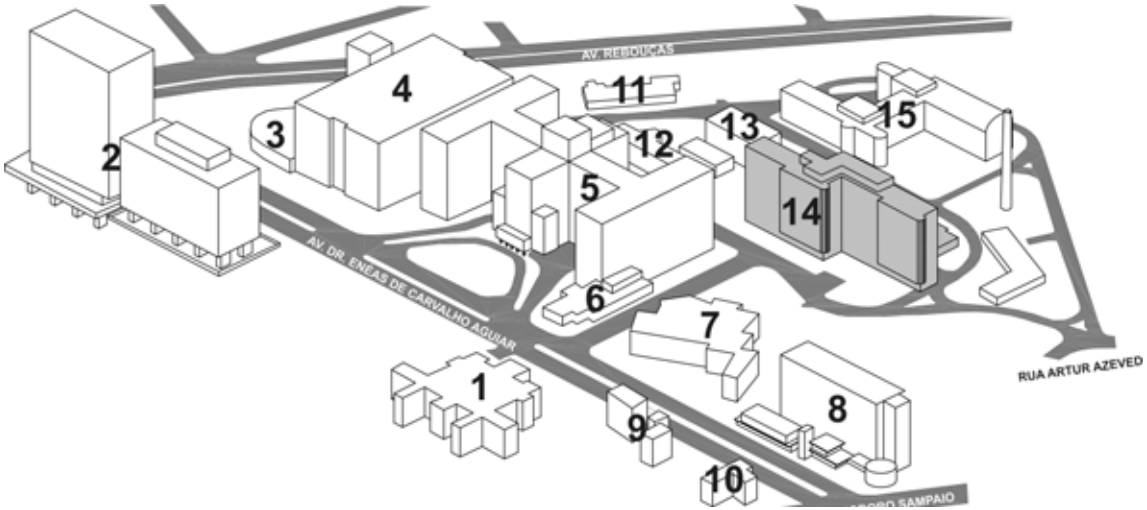
The Orthopedics and Traumatology Institute dealt with in this study was opened in 1953. It is generally referred to as the IOT and is a member institute of the largest hospital complex in Latin America – the São Paulo General Hospital [Hospital das Clínicas]. This complex is considered one of the most important centers in Brazil for producing technical and scientific information, and is thus a center of excellence and reference in the field of treatment, education and research in the health care area.

The hospital complex itself was opened in 1931 and today it occupies an area of 340,000 square meters, with approximately 2000 beds, 36,000 surgeries, 1.2 million out-patient services, and 66,000 hospital admissions per year. It comprises thirteen health institutions, including nine hospitals, the School of Nursing, and the Faculty of Medical Sciences of the University of São Paulo (USP), as shown in Figure 1.

The IOT was built to address the infantile paralysis epidemic (polio) in Brazil in the 1950s, and it provided all necessary orthopedic technology at the time for treating this disease and its sequels, although it treated fractures as well. Built on the model of modern architecture, it consisted of eight above-surface floors and an underground floor, providing a total of 20,000 square meters of built area with capacity for 300

beds and 400 rooms (1). Currently the IOT has 25,000 square meters of built area comprising seven specialized laboratories, 890 employees, 3,500 clinical consultations, 4,500 emergency cases and 500 surgeries per month and a clinical staff of over 200 physicians. With the eradication of polio, the institute began addressing demands for treatment, research and education related to other major orthopedic pathologies and disorders.

Nonetheless, the building retains many characteristics of style, construction structure and volume that were virtually original at the time it was built. Its floor plan in "T" format is divided into Wings A, B, C, and D (see Figure 2). Wings A and B are symmetrical, with eight floors interconnected by a central lobby called Wing C, where the elevators and stairways of common use for Wings A and B are located. Wing D currently houses the biomechanical laboratory, experimental surgery, animal laboratory and the prosthesis shop, and includes the basement floor, a ground floor and two higher floors. The Annex Building was designed and built later to address the need to expand the institute's services and facilities. The first stage of the Annex was concluded in 1972 and the second in 2005.



1 – FACULTY OF MEDICAL SCIENCES OF UNIVERSITY OF SÃO PAULO (FMUSP)
2 - HEART INSTITUTE (INCOR)
3 - REBOUÇAS CONVENTION CENTER
4 - OUTPATIENT BUILDING (PAMB)
5 - CENTRAL INSTITUTE (IC)
6 - RADIOLOGY INSTITUTE (INRAD)
7 - SCHOOL OF NURSING
8 - CHILDREN'S INSTITUTE (ICR)
9 - TROPICAL MEDICINE INSTITUTE
10 - FORENSIC MEDICINE INSTITUTE
11 - NUCLEAR MEDICINE INSTITUTE
12 – MEDICAL RESIDENCE
13 - ADMINISTRATION BUILDING
14 - ORTHOPEDICS AND TRAUMATOLOGY INSTITUTE (IOT)
15 - PSYCHIATRY INSTITUTE

Figure 1: Schematic Drawing of the General Hospital Complex of the Faculty of Medical Sciences of University of São Paulo.

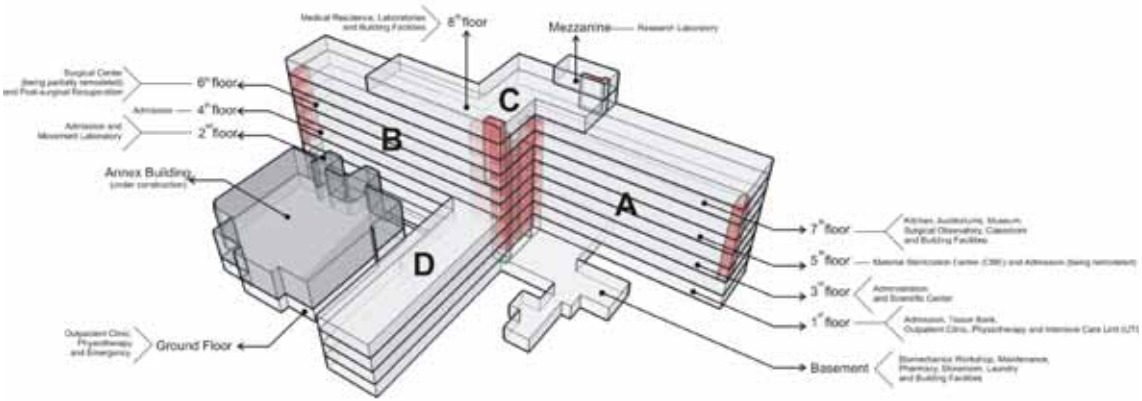


Figure 2: Schematic Drawing of the IOT Building and its Uses by Floor.

Evaluation Methods and Techniques

The present study began with a planning stage, which included the organization of the teams, scheduling of visits, scheduling and distribution of tasks, reconnaissance of the space, contact with key people, authorizations, walkthroughs, data gathering, annotations, drawing up of questionnaires, photographic records, physical measurements, structured and semi-structured interviews, and focus groups. Quantitative and qualitative studies were combined in order to expand the results.

At the end of the process all results were shown on the discovery maps, also referred to by Zeisel (2006) as discovery matrixes, as a way to synthesize and visualize the diagnosis, the recommendations and the pertinent standards and regulations, thus identifying the points that require interventions of short (most critical), medium or long term. This representation had the main objective of facilitating the understanding and reading of the results by those who will make the decisions and who are not familiar with the matters at issue. The flowchart of the process is presented briefly in Figure 3.

Results of Post Occupancy Evaluation

Diagnosis of Physical Performance

The IOT building has undergone several adaptations in the area of access, such as in some restrooms and certain ramps and parking places, but they have not always complied with the standards provided in the standard currently in effect, namely, NBR 9050: 2004 (ABNT, 2004).

In general, the areas of circulation, access doors, admittance and surgery areas, as well as elevators, have dimensions that enable persons in wheelchairs to maneuver or be maneuvered. However, problems were found with the stairways, with inadequate dimensions, railings and floors, and the absence of visual or tactile signs. In some environments of restricted use, access is hampered by narrow or heavy doors,

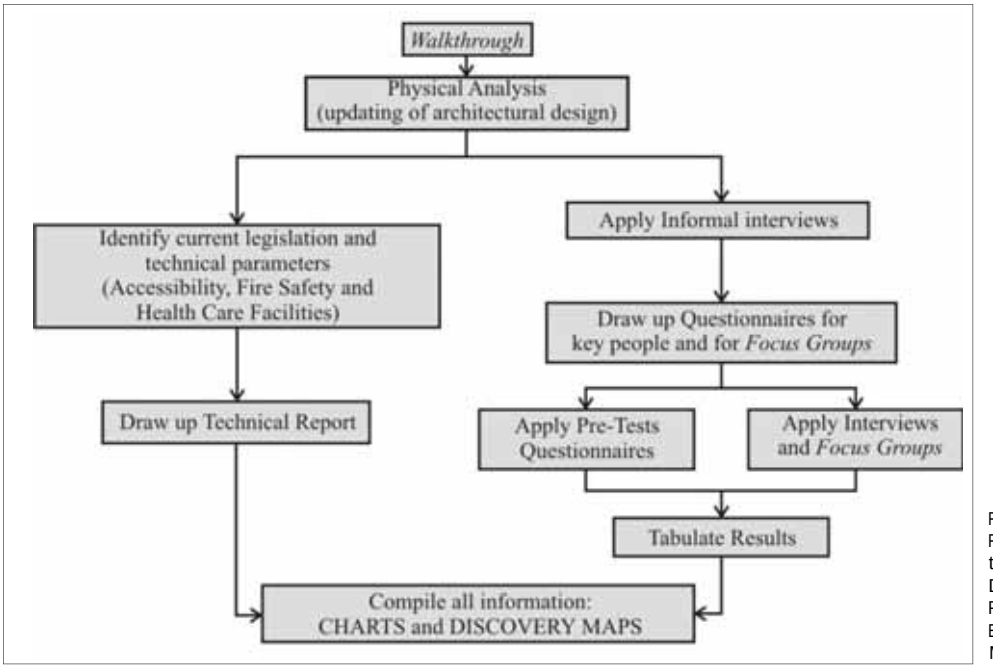


Figure 3: Flowchart of the Process for Developing a Post Occupancy Evaluation (POE) Mechanism.

door handles that are difficult to manage, and poorly arranged furniture.

The building's characteristics of construction and use classify it as having low likelihood for fires to begin or spread because there is little accumulation of flammable material and adequate building and finishing materials are used in the circulation and admittance areas (floors and walls). However, the emergency exits for vertical circulation were indicated as being hazardous for the occupants because the building has an open central stairway (Wing C) that would allow the propagation of gases and smoke. The same is true for the shafts of building installations that are not sealed off.

The side stairways (located at the end of Wings A and B, as can be seen in Figure 2) cannot be used as escape routes because they are not enclosed either. Access to them is obstructed by glass doors, they do not have the proper dimensions and the proper directional signs in place, and they discharge one floor above the exit to the ground floor. The essential fire safety equipment, such as extinguishers, hydrants, manual alarms and emergency lights, is duly installed, but there were no records of regular inspections and tests. The building has no automatic sprinkler system or fire detectors, due to the fact that only recently

have building codes begun requiring such equipment in this type of occupancy.

Verification of Users Satisfaction

The diagnosis made by the researchers was not always confirmed by the users in their responses to the questionnaires. This ambiguity is frequent, possibly due to a wide range of factors, such as lack of information by the users about the topic approached, superficial observation of the space, different levels of involvement with the location, and possible defects in the structure of the questionnaire itself.

Structured interviews enabled the detection of more specific aspects related to the use of the spaces and factors regarding the activities carried out, aspects which would probably not be noticed otherwise. The opinions expressed in the two focus groups held with nurses were compatible with the technical opinions of the researchers. The groups also cleared up doubts as to the functioning and use of the spaces. The unstructured interviews held during the study were also very important. A part from indicating problems that were not perceived in the first collection of data, they enabled the observation of the everyday life of the various categories of users who work there, and produced opinions that contributed to the analysis of the questionnaires.

Results

The results in the final report (Gill et al., 2005),

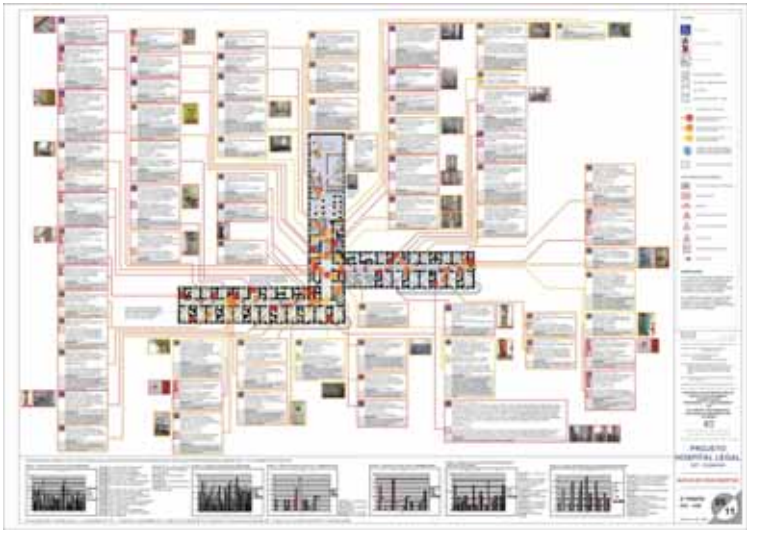


Figure 4: Example of Discovery Map (Floor plan of the 2nd Floor of the IOT).

Figure 5: Section of the Discovery Map for the Second Floor of the IOT Building.

FLOOR	LOCATION	FOCUS	RESULTS OF THE METHODS AND TECHNIQUES APPLIED IN THE RESEARCH			DEGREE OF IMPORTANCE	PROPOSAL	OBSERVATIONS
			Walkthrough		Interviews / questionnaires / focus groups			
			Problems Detected	Technical standards to be complied with				
2nd	Central Hallway	Accessibility	Absence of directional signs indicating the infirmary in Wing A	NBR 9050 (Item 5.5), which provides a number of recommend-ations to be followed regarding visual signs	The signs in the central hallway of the IOT were classified as Very good and Good by most of the nurses and students interviewed (See Graphs 1 and 2 in the Discovery Map of this floor).	Low	A sign pointing to Wing A should be placed at this location. The sign should also indicate in detail the type of activity conducted there (important information for visitors). The signs should also be available in Braille, and the format of the sign (colors and dimensions) should comply with Technical Standard NBR9050 (Item 5.5).	Although this question shows a low level of importance it can be easily solved.
			There is no sign indicating the location of the central stairway	NBR 9050 (Items: 5.13; 5.14.1.2, Figure 63; 5.14.2), which recommend, respectively, the presence of visual signs for steps, tactile alert signs on the floor, and tactile directional signs on the floor	----	High	Place visual and tactile alert and directional signs near the stairway	-----
	Central Hallway	Fire safety	Central stairway has a low protective railing (h=0.97m while the technical standard establishes h=1.05m) and there is no railing in some sections.	IIT No. 11 (Item 5.8.2.1) São Paulo City Building Code (Section 12.3.3.1), which contains recommend-ations regarding hand-railings and protection ratings.	Whereas most of the nurses interviewed considered the situation of the railings in the central lobby (= the central stairway) as Very bad, most students considered it Good or Regular (See "Appendices," Graphs 3 and 4 on the Discovery Map for this floor). In an interview, maintenance employees of the IOT informed the researchers (stated in the interview as the reason for the conditions of the stairway) that most people who use this central stairway move slowly, as they are users with difficulties, such as elderly patients or persons with physical handicaps.	High	Place a handrail with 2 heights (0.70 and 0.92m) along entire extension of the Central stairway. It should be easy to hold (4.5mm).	The central stairway is not classified as an escape route in case of fire, as it is not enclosed and could cause accidents in a fire situation (many people going down the stairway quickly), because the steps are slippery, the vertical span is completely open, and there are no handrails.

Table 1: Example of Synthesis of Results (Diagnosis and Recommendations) - 2nd Floor (partial).

summarized in tables, and allowed an initial visualization of the situation through one or more tools and techniques of the POE. One example is presented in Table 1, where a given degree of importance (low, medium or high) is attributed to each aspect in terms of the degree of priority for implementation. Discovery maps were drawn up based on the contents of these tables, as exemplified in Figures 4 and 5, which constitute a graphic synthesis of the research results.

Table 2 shows the number of evaluations and recommendations proposed. It can be seen that many more aspects regarding accessibility were detected than those related to fire safety. However, the priority given to fire safety is proportionally higher than that given to accessibility. This situation is perfectly understandable as problems related to fire safety are not usually specific for the various floors, but rather a characteristic of the building as a whole, in contrast to questions of accessibility, which vary from one specific place or situation to another.

Place	Focus	Degree of Importance	Frequency
Surrounding Area	Accessibility	High	4
		Medium	0
		Low	0
	Fire Safety	High	0
		Medium	0
		Low	0
Basement	Accessibility	High	3
		Medium	0
		Low	0
	Fire Safety	High	1
		Medium	1
		Low	0
Ground Floor	Accessibility	High	4
		Medium	4
		Low	1
	Fire Safety	High	1
		Medium	0
		Low	0
1st Floor	Accessibility	High	1
		Medium	1
		Low	0
	Fire Safety	High	1
		Medium	0
		Low	0
2nd Floor	**Accessibility**	High	26
		Medium	**43**
		Low	17
	Fire Safety	High	11
		Medium	3
		Low	0
3rd Floor	Accessibility	High	21
		Medium	31
		Low	11
	Fire Safety	**High**	**13**
		Medium	1
		Low	0
4th Floor	Accessibility	High	21
		Medium	35
		Low	18
	Fire Safety	High	11
		Medium	2
		Low	0

Place	Focus	Degree of Importance	Frequency
5th Floor	Accessibility	High	4
		Medium	2
		Low	5
	Fire Safety	High	7
		Medium	6
		Low	0
6th Floor	Accessibility	High	5
		Medium	4
		Low	4
	Fire Safety	High	7
		Medium	6
		Low	0
7th Floor		High	6
		Medium	5
		Low	0
		High	2
		Medium	7
		Low	0
8th Floor	Accessibility	High	4
		Medium	1
		Low	1
	Fire Safety	High	11
		Medium	2
		Low	0
Total	**Accessibility**	**High**	**99 (35%)**
		Medium	**126 (45%)**
		Low	**57 (20%)**
	Fire Safety	**High**	**65 (70%)**
		Medium	**28 (30%)**
		Low	**0 (0%)**

Table 2: Quantitative Synthesis of the Evaluations, with their Respective Priorities.

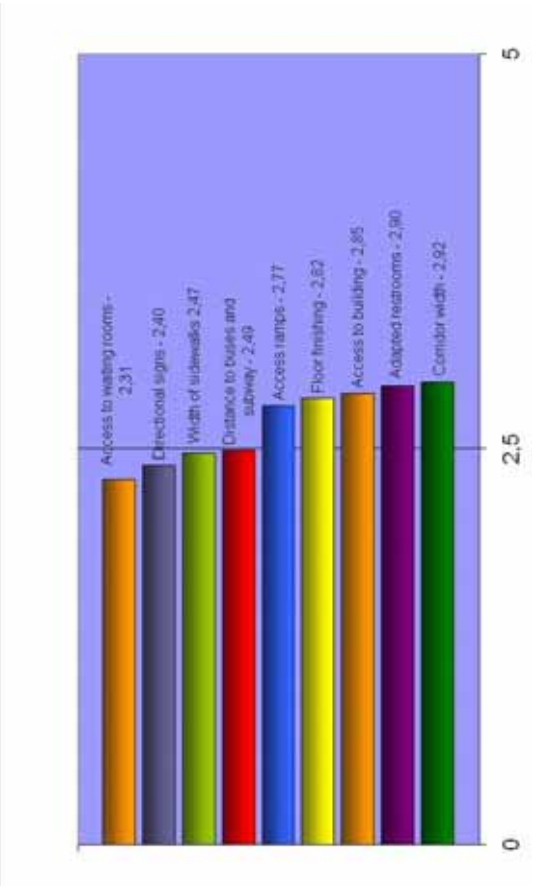


Figure 6: Users' satisfaction level regarding access points:

The graph shows an example of results obtained (average values in a score from 1 (bad) to 5 (excellent)) from applying the questionnaires incorporated into the discovery maps, and they clearly complement and corroborate the information gathered from the users' opinions.

Final Considerations

Methodological Procedures

As a result of this study, the authors consider that the methodological procedures of the POE addressed to the quality of management of the designing process in hospital buildings should include the following stages:

During the pre-test stage, analyze all possible shortcomings inherent to the application of the POE in a hospital where users are constantly subject to varying levels of stress;

Planning of the application of the POE and the intended results;

Development of solutions arising from the results of the POE, through architectural designs, design of furniture and equipment, and visual communication;

Definition of how the results visualized on the discovery maps can be presented to and discussed with the community of users, thus leading to subsequent truly collective designs;

Definition of procedures to guarantee that discovery maps are applied regularly and continuously to feed a databank (with diagnoses and solutions) based on POEs with the purpose of managing quality in the designing process;

Verification of the possibility of using the solutions shown on the discovery maps as benchmarks or references of quality in other hospital environments.

Quality of the Management of Designs in Hospitals in Brazil

Technological advances and more regulations in the area of fire safety took on greater visibility worldwide during the 20th century, but in Brazil the topic was first included in the São Paulo City Building Code only in 1975, and the first São Paulo State Fire Safety Regulations were issued by the Fire Department only in 1983.

The accessibility became a requirement in building regulations and codes in Brazil in 1980, but with isolated laws and segmented approaches. Only in 1992 did the legislation become more demanding and consolidated, with the São Paulo City Building Code, for example, which required compliance with Brazilian Technical Standard NBR 9050: 1985, regarding the adaptation of buildings and spaces for handicapped persons.

Several difficulties had to be faced in order to effectively adapt the spaces of the IOT building, due to its physical complexity and questions related to public management – which requires specific institutional measures to be backed up by the existence of financial resources for carrying them out and maintaining them. Nonetheless, this study has shown that such implementation is possible, provided that it is carried out in stages according to an order of priorities (high, medium and low) and, especially, with the involvement of its managers and employees, and that of the community, through clear proposals, open discussions of ideas that culminate in a collectively drawn up project.

The authors believe that, through the research carried out at the IOT building, it was possible to demonstrate the ways by which proposals for the needed interventions in hospitals can be evaluated and presented. Such an evaluation is particularly important in public hospitals, where processes of identifying problems, establishing

priorities for interventions and obtaining financial resources are usually dissociated. By carrying out a POE, these aspects can be more easily combined, creating synergy that will facilitate management and foster a better environment for the hospital's employees and users.

It was also seen that, in the case of hospital buildings and similar architectural designs (such as day hospitals, diagnostic units, emergency facilities, etc.), it is important and effective to apply the POE focused on the topics of *accessibility* and *fire safety,* which often overlap in terms of problems and solutions.

Therefore the authors see excellent opportunities for expanding this POE methodology to the entire complex of the São Paulo General Hospital. In fact, this process has already begun through a second case study, this time involving the Psychiatry Institute (IPq), also located at the General Hospital (GH) campus. Due to the size of the GH complex, and for the POE to be effective in producing of long-lasting results, it is likely that the best solution would be to prepare a group of professionals from the GH to systematically apply this methodology so that periodic evaluation of the buildings and open areas around them become systematic and routine events.

At least at the beginning, the existence of an external mechanism for evaluating the results should be also beneficial for implementing the proposed culture of evaluation. In addition, in the case of Brazil, the Hospital Accreditation Program could become a mechanism for refining the POE for hospitals. Among this program's objectives is that of "Improving the quality of treatment through the means of periodic accreditation of both public and private hospitals," as well as "Instituting internal mechanisms of self-evaluation and continuous refinement of the quality of the medical treatment provided by hospitals" (Novaes, 1999: 07).

Mechanisms such as the Hospital Accreditation Program create a procedure of self-evaluation in consonance with the objectives of the POE, and can be used in conjunction with it in the effort to improve the quality of use, circulation, treatment and safety of the complex.

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Notes

(1) Information available at the website of the General Hospital Complex of the Faculty of Medical Sciences of University of São Paulo: www.hcnet.usp.br [August 10, 2006].

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DAYLIGHTING AND ENERGY PERFORMANCE OF POST MILLENIUM CONDOMINIUMS IN SINGAPORE

Uma Maheswaran & Ang Guo Zi

Abstract

Condominiums are the most common typology of housing next to public housing in Singapore. In Singapore, government planning directives and incentives play a major role in market trends. Facade projections promoted by the URA (www.ura.gov.sg) in recent years had subsequently found way into the post-millennium facades (glass balconies and bay windows). Expectations of living conditions have grown as Singaporeans gradually adapt to the air-conditioned lifestyle. Design of private residential developments (condominiums) in Singapore is mostly undertaken by foreign architects and this has resulted in a typology that neglects the wholesome concept of tropicality both in terms of climatology as well as living style. Extensive use of glass in these units has resulted in lack of privacy, poor day lighting performance as well as uncomfortable thermal conditions. Plastered facades of the seventies have given way to modern glass-skinned facades and high-end condominiums today have started to provide inbuilt air-conditioning. Statistics show that monthly household electrical bills have increased steadily over the years and 50% of Singapore's overall energy consumption is solely consumed by air-conditioning. A thorough case study of one such condominium development was attempted and the results obtained through this pilot study were then used to analyze the trends across prototype units using simulation tools. The results show that the residents of such units pay a very high rate for electricity resulting from air conditioning the habitable spaces in their residence.

This paper is an attempt to discuss a few examples of condominiums around the western part of Singapore as a means of discussing the emerging design trends as well as to discuss the performance aspects of the design solutions in terms of day lighting and energy consumption.

Keywords

condominiums, tropical facades, ETTV, insolation, day-lighting

Introduction

Singapore's pertinent land scarcity problem resulted in the intervention of the government with the Land Titles (Strata) Amendment Act in 1999, which eased the legal problems, associated with en bloc sales, whereby the requirement for unanimous consent from the members was removed and a majority vote was replacing the same. This facilitated private development and has resulted in an effective increase in the number of condominiums that developed during the last five years. Singapore had moved into a techno – era,

in which almost all the buildings in Singapore became air conditioned. Almost 80% of the energy consumption in buildings of Singapore comes from the air conditioning systems. However, with the growing awareness around the world on the concept of green buildings and with even more critical issues including global warming, Singapore has now realized its part to play and is slowly moving towards an energy conservative approach across all fields. Particularly, on the buildings side, "Green Mark scheme" and "Energy smart buildings scheme" (www.bca.gov.sg) are some of recent attempts by the country to induce the momentum amidst the designers and contractors to move towards developing an energy conscious country as a whole. A very high energy penalty is associated with the ventilation component in air conditioning, particularly in the tropical climates and this is apparently due to the very high enthalpy difference that exists between the outdoor and indoor air conditions. This is reflected in the increase in energy use across all typologies of buildings, and even in domestic electricity consumption, approximately 50% increase was evidently seen over the last decade. To add on to the complexity of the issue, the design of these private residential apartments are becoming more and more transparent in terms of their facade and this often results in very high cooling loads in the living spaces, in turn higher energy consumption. This paper is an attempt to address the complex phenomenon of energy consumption in private condominiums developed during the recent times, with a relatively transparent facade design.

Condominiums in Singapore – A Prelude

Condominium developments were conceived as an urban planning strategy to address 4 main problems then:

- Wasteful sprawl of low density developments in suburbia
- Fragmentation of plots
- Provision of land for recreational communal activities in residential zones
- Inadequate maintenance for community facilities

In other countries, condominiums have the tendency of arising in central districts for convenience and accessibility whereas in Singapore, it was the suburban areas which yielded Singapore's first condominiums as a governmental reaction to under-utilization of suburban land resources (Lee, 1989). The ability to afford private housing in Singapore is limited by the scarcity of land and understandably, high prices. Consequently, the ability to own a private property has become "the Singapore dream" (Ong, 2000). Condominiums typically refer to a form of property ownership in which each owner holds the ownership to their individual unit including a small fraction of entitlement to the common areas of a multi-unit project. Typically, the concept of condominiums ad-vented in the early 70s of the last century with **Pandan valley and Ridgewood** being the first two condominiums that developed in Singapore.

Typically, more than 50% of the total development of condominiums is targeted around the prime residential districts of Singapore and the balance is scattered around the fringe areas of the island. The

demand for private housing types in Singapore is constantly increasing and the economic boom in the recent years has resulted in a much higher demand for such development. With the increase in demand, the number of condominium developments around Singapore has also increased in number tremendously. These units which were typically purchased by foreigners in the past are now being purchased extensively by the locals (Singaporeans) and this reinforces the escalation of living standards of Singapore citizens. This dynamism in the demand and supply as well as the occupant type (local or foreigner) seems to be having a high correlation with the design of the prototype as well. Figure 1 shows a range of condominiums ordered according to the years of completion and it is suggestive of the change that has happened during years in the design thinking of a condominium.

Figure 1: Condominiums of Singapore

The concept behind the design of a condominium block has been constantly changing and the most obvious change is in the transparency of the facade design. The facades of the post – millennium condominiums have become more transparent and the upcoming condos fully rely on clear glass facades. The irony in the design of these condominiums is that they are often conceptualized and designed by foreign architects for the unique tropical climate. Typically, many of the upcoming designs of facades for such buildings are just clear glass and the privacy of the occupants is highly questionable. Facades

of condominiums of a low height and with clear glass are constantly found to be blinded by the occupants to safeguard their privacy and protect the inside from the scorching tropical sun. With the growing numbers of such developments and the coarse grain nature of the design, this matter would soon need to be highlighted to the Urban Redevelopment Authority (URA) (www.ura.gov.sg) which aims to develop a harmonized global city in the future.

A Visual Analysis of the Upcoming Glass Facade Trends in Condominiums

In every modern and post-modern city, ponderous facades of masonry and brick are constantly being dissolving into modern curtain-wall facades and this change could be attributed to the increasing density of the urban-scape. The claustrophobic compactness has perhaps contributed to a general renouncement of the physicality and visual dead-weight of masonry and plastered facades. Lightness, transparency and dematerialization have become central themes in modern architecture applicable both to commercial and residential buildings. This movement towards lightness as a spatial concept could be traced back to the medieval European Gothic church, where great expanses of glass and the verticality of the pointed arch were architectural allusions to spiritual attainment, by technically creating a visual straining of space heaven-ward. Evidently, the purity and ascetic character of glass has been carried forth into today's architecture.

Fully-glazed buildings are delineated cleanly by curtains of glass which sharply define spatial boundaries creating a sense of tautness and economy to modern space. The impermanence of incorporeal glass facades can also be interpreted as a cultural symbol of 'Globalism'.. Transparency is evocative of the profound influence of public mediatization, the animated surface, maximum 'visibility' and boundlessness of the internet dimension which is the prevalent basis of today's socio-economic progression. These ideologies behind the curtain-wall facade have percolated Singaporean architecture. In following sections, various reasons glass facades have been increasingly applied to condominiums in Singapore, particularly in the post-millennium period were discussed. Some of the newer developments assume that the young crowd wishes to see and be seen, at once becoming part of the spectacle of the cityscape as they observe the spectacle.

However, two notable points deserve mention here. Firstly, although later generations of Singaporeans in general might not oppose Western influence and may even be said to be highly receptive to its pop culture, some social preferences are more deeply-rooted in our Asian psyche than are immediately apparent. A deep-set, almost inbred propensity for privacy can be traced back to the Chinese courtyard house; its three-tiered spatial layering by means of internal courtyards separates the various sections of a household, with the innermost courtyard being the most private space reserved for those with the highest family status.

Thus in traditional Asian architecture, spatial differentiation not only acts as an organizational device but also accords manifold meanings to

communal spaces, where the conferment of privacy and tranquility is regarded as a measure of one's social status. In contrast, the Western communal outdoor space consists of a front lawn facing the main street. In this manner, the Western private space is somewhat more loosely defined. Thus perhaps the 'openness' of a facade may be tolerated in Western culture, but this cultural disposition is not readily transferable to the Singaporean Asian society. This distinction between private and public life can be observed in newer condominiums where curtains or blinds are habitually drawn to preserve the occupant's privacy.

Another imported Western concept is the desire for daylighting in temperate geographical zones. However, in Singapore's harsh tropical climate, direct midday light is barely tolerable, especially when it floods enclosed and poorly ventilated spaces. The architectural imagery of austere modern glass facades that has been transplanted here is inappropriate in our unremitting heat from high-angle overhead radiation. Overseas architects who typically design for temperate climates and who have been commissioned to design condominiums in Singapore tend to overlook the harsh tropical conditions occupants here inevitably face. Two such examples are the 'Edge on Cairnhill', designed by Moshe Safdie, and Kent Vale, designed by an American architecture firm. Both condominiums use clear glass in fully glazed facades which have proportionally small open-able areas.

The condominiums are designed based on the assumption that air-conditioning will perpetually be available and have given neither thought to nor allowance for natural ventilation. Qualities such as machine-like economy and clinical detachment in architecture have arisen as new conceptions of beauty, but it seems comfort has not been considered a function of beauty in architecture. The 'Image-ability' of the glazed facade in Singapore seems to be based on the 'idea of modernism' rather than the principles of modernism itself such as progressive thought and self-reflection. It is a symbol, rather than artifact of modernity. The baseless replication of these transparent facades ignores the pluralism of vernacular architecture and materials available to architects. Ecological technology and differentiated treatment for facades at different storey heights can prove to be more valid generators of 'image-ability' than the unrestrained use of glass.

Insolation and Daylighting Studies of a Typical Condominium Facade

A preliminary overshadowing study and a sun path analysis on the various facades in the layout of the **condominium xxx** were done and sample results are presented in the form of stereographic diagrams in figures 2 and 3. The studies showed that the facades were completely exposed at least during half of year, in the morning periods or the afternoon periods depending on their orientation. The inner facades facing the courtyards received the overhead sun consistently during the time periods between 11.30 a.m. to 3.00 p.m. (Figure 3). A set of insolation studies were conducted to identify the total incident radiation in W/m^2 is also presented in figures 2 and 3. The scale shows that most of these facades received very high incident radiation levels of the order greater than 150 W/m^2. The ETTV regulations of Singapore stipulate an optimum value for

ETTV as 35 W/m^2 and most of these facades are completely glazed with clear glass. This would in turn result in very high ETTV values which in turn could result in uncomfortable indoor temperature conditions. The current trend in the condominiums is to centrally air condition the whole unit and these high radiation levels incident on the facade has a direct bearing on the cooling loads resulting in the indoor spaces. For the particular condominium xxx under consideration, it is very clear that the resulting cooling load in the living space behind the fully glazed facades will be very high. The direct to diffused radiation levels in Singapore is also unique thus posing problems in terms of shading device designs. However, it is evident from figure 1 that most of these condominiums in the recent times are fully glazed with a curtain wall style of cladding to the facade which in other terms would mean “zero or minimal” shading.

The diffused radiation is predominant in the case of tropics in approximately a ratio of 3:1 with the direct radiation. Hence, combating the high angle sky reflected components, the low angle ground components and the reflected radiations from the opposite and adjacent reflective surfaces is a major task in the case of

Figure 2: Insolation Studiy to Identify the Total Incident Radiation in W/m^2.

Figure 3: Insolation Studiy to Identify the Total Incident Radiation in W/m$^{2.}$ The Study Illustrates that the Inner Facades Facing the Courtyards Received the Overhead Sun Consistently during the Time Periods between 11.30 a.m. to 3.00 p.m.

Singapore. This consideration is also absent in the current designs of the condominiums.

Figure 4 shows a sample day lighting simulation on the 10th storey of a block that is oriented with its long facades facing east – west. The lighting levels shown in the figure clearly portray the situation in Singapore which is also unique in terms of its lighting patterns. As the stereographic diagrams clearly show that most of these facades are exposed to the overhead sun, the sun rays are almost at a very high angle and hence, there is a predominant glare issue around the window area, and the lighting levels immediately die down after the perimeter zone of 3 m span. The reduction in lighting levels is drastic in the lower floors and the higher floors have situations, where the occupants have constantly had their screens drawn to protect the space from glare. This situation is worsened in the case of fully glazed facades as the original design intent of the architect of "having an environmentally interactive facade through which the occupant inside can feel the outdoor

spaces" is completely lost when the occupant draws his blinds or screens continuously. The lighting levels on the top floors near the balcony spaces reach nearly 1000 lux and the interior spaces are often under very contrasting lighting levels as low as 150 – 300 lux.

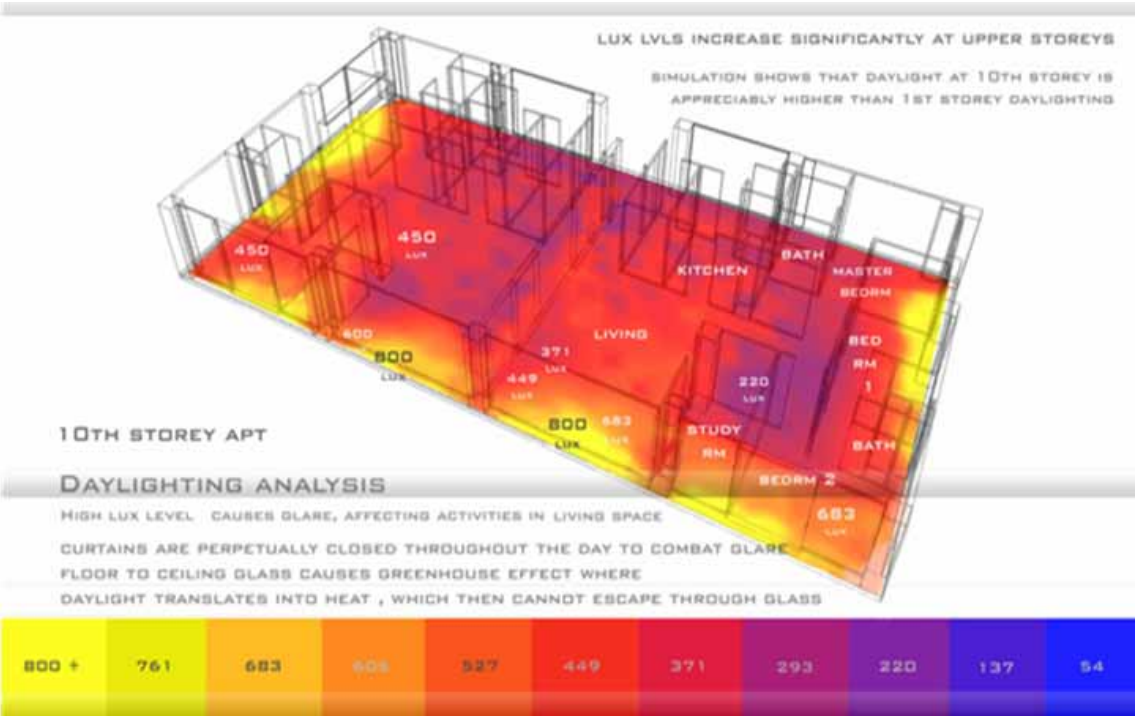

Figure 4: A Sample Day lighting Simulation on the 10th Storey of a Block that is Oriented with its Long Facades Facing East – West.

Energy Analysis of the Condominium

A simple energy analysis of the condominium xxx was done with the VisualDOE software based on the following assumptions:

- The condominium was considered to be centrally air conditioned for the living areas including the vestibule, dining, study rooms and the bed rooms.
- The dimensions of the aluminum frames in the windows of the fully glazed living rooms and bed rooms are assumed to have the default software values.

The energy analysis clearly showed that the predominant component of the cooling loads resulted from the radiation component of the facades. This attributed to be around 1/3rd of the total wall conduction which in turn resulted in very high ETTV values (approximately 116 W/m^2) when a single clear glass facade was considered. Considering the total number of units to be approximately 500 in a private condominium development, the estimated utility bill for a single unit in terms of electricity consumption worked out to be around $ 220 per month. Out of this total amount, 50% was attributable to the air conditioning costs of the unit. Based on the current condominium configuration and the facade design, the overall energy efficiency index for the development worked out to be 252.4 KWh/m^2/year, which is much higher than the recent targeted values of less than 125 to 130 KWh/m^2/year based on the Green mark buildings scheme.

The basic simulation in terms of the energy consumption showed very high values of electrical energy resulting out of poor facade design and lack of due consideration to the tropical climates. An estimate was made in terms of the savings potential of this particular development with a comparison of the utility bills to that of a standard 3 – bed room public housing unit. The average consumption of a typical unit of similar size in the public housing types is about 444 KWh per month (www.spservices.com.sg), which would work out to be $95 per month approximately. Considering the class of private housing and the demand type, if we even reduce the electricity consumption by 25%, the whole estate would be able to save approximately S$ 1 million every year.

Conclusion

The design of facades is a highly critical aspect in the design of a building. With the growing awareness in terms of energy conscious building designs, it is necessary that building designers give due considerations to the various factors that determine the efficiency of a facade. The perimeter area of the facade, the orientation of the facade, the time period of facade exposure and the level of self shading and designed shading for the facades, the position and sizes of openings and the materials used for the facades are some of the very critical aspects to be considered in the design of energy efficient facades. Singapore's private residential properties are transforming into more transparent outlooks. The concept of office cum home, Central Business District living and others have slowly transformed residential developments into full glass boxes. Many latest designs of condominiums follow curtain wall glazing types similar to commercial buildings. However, for the tropical subjects, both in terms of their climatic zone type and their living style, such facades pose a number of problems. The designers often fail to understand this fact and they design with dreams far away from realistic situations. The underlying question that this paper poses after this analysis is as follows:

"*If glass facades are preferred to be kept always blinded or screened by the occupants in order to secure their privacy and also to protect the space from problems of too much heat and glare in tropical climates, then why do architects provide fully glazed facades?*"

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RESTRUCTURING 21ST-CENTURY ARCHITECTURE THROUGH HUMAN INTELLIGENCE

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Abstract

This paper introduces a compelling new way of thinking about, teaching, and practicing architecture. Founded on the basis of how the human mind perceives and interacts with the built environment, we call this new design process "intelligent architecture". Perhaps surprisingly, scientifically-conceived rules for architectural design and building can lead to a more human architecture, one with a renewed respect for traditional methods of architectural design. This new process can also be extended by implementing new technologies. By applying the most recent scientific advances to architectural thinking, we can better appreciate the architectural heritage of the past, giving scientific insight into its origins and manner of conception. This development also reverses an unfortunate misunderstanding that required the future to erase the past rather than to learn from it.

Keywords

Architecture, adaptivity, intelligence, tradition, authenticity.

Introduction

For too long now, the circumstances of a global economy have directed the ebb and flow of intellectual and cultural exchange throughout the world. Skewed by the influence of media-driven societies, the architectural stage has been rigidly set by concepts and imagery that are irrelevant not only to their users, but equally to other cultures. As we look around the world, it is becoming more and more evident that we are not the masters of our own profession. Architecture has become the exclusive domain of the so-called "Star Architect" (*starchitect* in common usage), no longer operating as a conveyance, but as a usurper of culture and identity.

The distinguished Pakistani architect Hammad Husain expressed a widespread frustration with this phenomenon when he asked in 2003: "*What makes an architect famous? Is being famous directly proportional to being good?*

If yes, then does it mean in the whole of Asia and Africa there are no architects good enough to be world-famous?" (Husain, 2003). Not many architects from China, India, Russia, South America — i.e. the vast bulk of humanity — ever make it into the glossy architectural magazines.

How can anyone believe that a "Dutch Design Demigod" could know more about a place than the very people who were born and raised there? How can these *starchitects* espouse to know what is best for the rest of the world? More importantly, how do we combat the aesthetic authority that such individuals now exert over our place in the world?

The antithesis to this abstract aesthetization of the world is the concrete actualization and restructuring of how the built environment is conceived. This requires a blending of one's intimate knowledge of culturally-specific values and beliefs with a 21st-Century understanding of how human intelligence affects the artifacts — i.e. buildings and places — that we create. Such knowledge comes through science and the scientific approach to understanding the world. Uncovering the foundations of the architectural experience through science leads us to the processes of human cognition and intelligence. Through this discipline the seeds of a new, intelligent architecture have been discovered.

Accepting human intelligence as a unifying principle for the architectural design process enables us to fundamentally restructure architectural education and practice, in a manner that leaves little room for idiosyncratic or ideological expressions. Efforts in this direction have been attempted in the past, most notably by Christopher Alexander (Alexander *et. al.*, 1977) and by Ashraf Salama (1995; 2005). The proposals aroused more opposition than interest in the architectural community. Even after trenchant criticism of the present system of architectural education as being mostly irrelevant (Bothwell *et. al.*, 2004; Boyer & Mitgang, 1996), no reforms have ever been successfully implemented.

We now know with certainty that the human mind readily recognizes and seeks out coherent information in our surroundings (the material world). Meaning extracted from raw information from the built environment helps to tell us whether a place is healthy and nourishing, or deleterious and dangerous, etc. Information, and the intelligence that processes this information to make it meaningful, provides an integral link between humans and the physical reality that we perceive. This is crucial because this is how we establish our sense of wellbeing, making decisions such as fight-or-flight responses. We are sentient beings, neurologically wired to look for certain kinds of structure in the complex informational fields that surround us.

Innate intelligence represents the deepest type of information processing, common to all people, and thus is not the exclusive domain of architects. An engagement with the material world generates meaning and awareness for everyday human beings, but it takes training, practice, and discipline to understand the process by which this interaction occurs. This knowledge is essential for architects if we are to conceive the built environment in a way that connects to humans on this level. Architects

can employ this process to re-create built environments that utilize patterns, spaces, and textures in an effective manner to nourish human existence.

Taking as a point of departure the mind's compulsion to establish a connection with our environment, natural and human-made patterns serve as the principal conveyance of meaning about the world around us. The symbiotic relationship between ideas, images, texts, and biological forms helps to explain how human culture, consisting of created objects as information, essentially extends our biological bodies into our environment. Traditional architecture carries with it the same intrinsic structural order that underlies all physical and biological entities (Alexander, 2002-2005).

A Methodology for Architectural Design

Intelligent architecture is not prescriptive: it does not tell you to build transparent glass boxes; nor opaque white cubes with horizontal slit windows; nor buildings with curved shiny titanium surfaces. All such formal prescriptions are ultimately expressions of a visual ideology encapsulated in the architectural mantras of modernity as pseudo-religious belief, which has come to replace true religious beliefs (Salingaros, 2004). Intelligent architecture, on the other hand, represents evidence-based results found in the work of several individuals and groups (Alexander, 2002-2005; Heerwagen, 2005; Kellert, 2005; Kellert & Heerwagen, 2005; Krier, 1998; Salingaros, 2005; 2006; Wilson, 2007).

The science behind intelligent architecture underpins and ties together distinct new developing architectural movements and practices. It provides a common theoretical support for Biophilic Design, Classical and Traditional Western Architecture, Traditional World Architectures, New Urbanism, Sustainable Architecture and Urbanism, and User-built Social Housing throughout the world. Each of these disciplines is finding that scientific evidence helps to structure and validate its methods. A brief summary of several decades of scientific research is impossible. In the context of this record, we can only give the reader an idea of how these techniques are applied to design in a real world, explained in a straightforward language. Note the sequence of design steps: the overall form of the building arises out of basic human concerns, and becomes clear only towards the end of the design process. Starting with a pre-conceived form is working from a conditioned response, not an intelligent response.

1. VISION. We start with no preconceptions of form, but instead generate a physiologically-nourishing vision of the building from the viewpoint of the user. Whereas studio courses teach architects to see initially and primarily what the building looks like from the outside, we design as seen from the inside. We conceive an organized whole whose interior and exterior are revealed simultaneously. This vision should include portions of the building at different scales, including very small details. We sketch (on paper and on a computer) different aspects of this vision, growing out of the question: "*What is the most wonderful/real/authentic building/shape/texture/space that I can imagine to house this activity?*".

2. TRADITION. Any thoughtful and sensitive architect will (or should) possess a treasure-store of mental references of the most glorious

examples of buildings from their culture's traditional practice. Those must be allowed to exert their influence, enriching without imposing any specific form on the present project. As the design works its way through the mind of the architect, it becomes inevitable that the final design will assume some characteristics of traditional buildings specific to that locality.

3. ORNAMENT. Architecture and ornament (ordered detail) are one and the same thing, ornament being simply architecture on the smaller human scales of 1mm-1m. The appropriate ornament supports the forms on the larger scales. Numerous sketches of the project must be made on all different scales, from the size of the entire building, to intermediate scales, down to details on the human scales. We make full-size mock-ups of different portions of the building to judge relationships among the components.

4. TRANSITIONS. The form arises out of individual elements from the user's optical perspective and physical movement. We design entry-points, circulation, transitions, path-connectivity, and working spaces from the inside. Every decision comes from a mental extrapolation of the experience of inhabiting those spaces. This approach subordinates formal spatial concerns to the connectivity of lived spaces. It is essential that structures built primarily to help connections are just as accommodating to human sensibilities as the spatial nodes themselves.

5. PARTICIPATION. We devote energy and time to conducting in-depth question sessions with the actual eventual users of the building, from the people who will be using it full-time, to occasional future users. Ask them: "*What is your VISION of the most wonderful building to achieve this task? Please describe the approach, entry, working area, light, trees, recreation area, etc. of this building as you would ideally like to experience.*" Collect these surveys, and give them priority in the design process over and above any formal concerns, and even the architect's initial ideas.

6. MATERIALS. We try to use indigenous materials. Usually, the most appropriate materials are local vernacular materials, as they help to extend the mental parameters of the structure in the immediate setting. Structural decisions must first and foremost arise out of concerns of adaptivity to local climate and social customs. Towards that end, one can ask how contemporary technology can contribute to the overall tectonic goal. There is no need to exclude high-tech materials, just as there is no need to exclude local materials. Technology alone should not dictate the form or expression of a building, since its conception establishes a distance between humans and the world.

7. URBAN. Attach the building design to the existing urban fabric as intricately as possible. If there is none in place, then carefully design urban fabric that encourages maximal pedestrian connectivity around the building. Blend in trees, natural forms, and water as much as possible, not as decoration or formal *appliqué*. Give priority to human scale and nature rather than to cars. Consider approach and transportation that will reinforce adjoining patterns of space and circulation. The new building should blend seamlessly into the existing complexity of nature, built form, and human activity in the immediate region.

8. FORM. A final decision must be made as to the overall form of the building. We usually

leave the form unspecified as long as possible, though it may have occurred in the architect's initial vision. Even if the architect had some clear vision of the building's form, all the above design considerations should have invariably adapted that form to accommodate human needs, as outlined here. Thus, no form can survive unchanged during an adaptive design process without negating the human dimension, and the architect must recognize this.

While this series of design steps might seem, at first glance, to outline methods familiar to practicing architects, the sequence is intended to redirect the design process away from any preconceived or prematurely-conceived expression. That would negate the mind's ability to establish the needed neurological connections.

We are using this eight-fold method to design new buildings and to repair older buildings so they become more humanly adaptive. This is precisely how architects used to construct buildings in all cultures. Those are the buildings that are most valued today by everyday people the world over. It is through intelligent awareness that these structures speak to us and seem to be touching our soul. We don't however advocate a gratuitous return to traditional design methods, since the values, beliefs, and physical context for the underlying elements of design are always changing. Our method relies on recent scientific results. Perhaps surprisingly, these investigations have led to an increased understanding of the intrinsic value of religion and traditional culture for humankind's development.

During the second part of the twentieth century, people were told that creativity depended upon throwing off any preconceptions one might have. That is a misleading concept. Creativity is intelligent only when we have general working principles to build upon. Unguided design only leads to frustration, which in turn forces designers to copy something already realized. Architects are nowadays psychologically conditioned to turn away from traditional-looking solutions, yet are not given the design tools to create human environments. What is left is to copy what the currently fashionable *starchitects* are designing. With such a frustrated mind, you inevitably resort to copying what is assumed to be originality in others. Thus, the quest for originality has turned into mindless conformity.

There is more at stake here than architecture alone. The very fabric of culture and society depends on how human beings view their fellow citizens, and how they manage the built environment. Critics who wish to dismiss our program do so as a defensive gesture. In our effort to help construct/conceive a better world we have exposed the vested power and interests of an elite minority. It is unfortunate that those individuals, whether knowingly or not, participated in a process that has been slowly eroding humankind's architectural conscience. Worst of all, generations of architects the world over have been misled to do the same thing. Many of those students from the traditional world have returned to their countries as unwitting agents of a destructive western form of aesthetic hegemony.

Criteria for an Intelligent Architecture

Intelligent architecture is responsive to human needs and sensibilities through adaptation to existing buildings and nature. This is a new way of viewing the world a way of connecting to

it, and to ourselves — yet it is very much the same as the most ancient ways of connecting (Alexander, 2002-2005). It provides a way of judging whether a building or piece of urban environment is good or bad for our emotional health. Yes, a building can be either good or bad, to different degrees (Salingaros, 2006). People don't need experts to tell them whether a building is good or bad — they are fully capable of judging for themselves. Here's the method — just ask yourself the question:

"DOES THIS BUILDING MAKE ME FEEL MORE ALIVE, OR LESS ALIVE?"

Note the specific nature of the question. It does not ask: "Do you like this building?" or: "Does this building make you feel excited?" since those answers lead to ambiguous conclusions. Likes and dislikes are due to individual preferences overlaid with educational conditioning. It is hard to distinguish what is influencing our decision. In a similar way, emotional excitement could be due to either pleasure or alarm, and again, it is often difficult to distinguish between these two physiologically opposite responses. The question instead digs deep into the subconscious networks that constitute human intelligence, and seeks to identify a building with our own living structure. We use the neural circuits already evolved to connect us to our environment.

A second question examines the coherence of a building. This is a very easy method for judging the coherence of highly complex visual structures. Pick any identifiable subunit of the building, some obvious component (such as a wall, column, doorway, window, cornice, etc.), and ask yourself:

"DOES THE OVERALL LIFE OF THE BUILDING DIMINISH IF I COULD MOVE THIS PIECE OR CHANGE IT IN ANY WAY; OR EVEN REMOVE IT ALTOGETHER?"

In a good building the answer is yes, for each piece, regardless of size. Every piece belongs exactly in its place, and has exactly the right shape and materials to reinforce the overall coherence of the whole. It contributes to unity and adaptivity. In a lesser building, on the other hand, pieces are irrelevant and hardly belong to the whole. They have become decoration (i.e., structure that has no meaning or purpose, and is added solely for fashion). Removing them or drastically changing them does not alter the overall coherence, since it is nonexistent. Why, then, are they included? Style is not a good justification; it is so superficial and trivial a reason as to be meaningless. If you as the user can envision a portion of a building improved — so as to make it more adaptive in its use and in its direct physiological impact on you — then the architect has not done his or her job of seeking coherence, but has instead imposed arbitrary forms or a formal compositional bias.

The brain, being capable of highly-sophisticated computations, instantly evaluates the geometrical coherence of any structure. The output is through emotion (sensation) linked to a physiological state (either alarm, or calm). These are the physiological precursors to any conscious system of values. To profit from this mechanism, however, we need to break out of the modern paradigm and the myopic vision of others. For example, contrary to what some *starchitects* claim, our technology does not dictate any particular architectural style. If we look beyond the signs and symbolism of the traditional architectures of the world we

can discover, through their physical presence, an informational content that speaks to us on a human level. Empirically, traditional architecture had scaling, materiality, and a sensibility towards construction, proportion, and human nature. It is this quality that characterizes timeless architecture.

Clues from Biology

To better understand how humans interface with architecture, we must go directly to the underlying constituents of architecture, the basic building blocks as it were. These pre-stylized, pre-cultural, unaffected, yet essential expressions are now identifiable and quantifiable through science. We have found genetic algorithms, Darwinian processes, emergence, capillarity, fractal structure, membrane interfaces, information compression, small-world networks, inverse power-law scaling, etc. playing a central role in how the built environment functions. We now offer these concepts in an architectural language that practitioners might use to improve their work (Alexander, 2002-2005; Salingaros, 2005; 2006).

Knowledge from biology, robotics, and artificial intelligence can be applied to design so as to extend the human experience, but not in an iconic, superficial manner (Salingaros & Masden, 2006; 2007). The key to a new architectural form resides in the knowledge of how physical/biological structure evolves and holds together; knowledge of complex interacting systems; knowledge of the adaptivity of forms to forces and changing conditions; and knowledge of how our intelligence binds us with the physical world. These processes allow us to understand the evolution of increasingly complex forms, as opposed to the abstraction of forms driven towards a singular expression.

At the top of the evolutionary ladder lies the complex neuronal system that makes human intelligence possible. In addition to storing knowledge in their brains' neural circuits, human beings also habitually use their built environment as an extension of biological memory. Books, artifacts, song, ornament, and social patterns represent the "collective memory" of a particular culture. Represented memory encoded in traditional buildings has been guiding architecture for millennia. This powerful repository of what we already know about our responses to environmental structure can be as apparently trivial as a particular ornament, a color, a space of certain proportions, or the texture of a wall. It is through intelligence that architecture reveals itself to us in form, texture, color, and scale.

Socio-geometrical patterns embedded in traditional architecture and urbanism complement the inherited knowledge encoded in texts and oral literary traditions throughout the world. These externalizations of brain functions encode information derived from experience over the entire course of human evolution (Salingaros, 2005; 2006). Collective memory thus provides the foundation of culture and civilization. It is only recently that the patterns observed in traditional cultures, coming from innate human preferences, were found to have a genetic basis (Heerwagen, 2005; Kellert, 2005; Kellert & Heerwagen, 2007; Wilson, 2007).

Built knowledge (represented in the built environment) is both complex and irreducible — i.e., it is very difficult to simplify and transfer

into written text. Christopher Alexander made a first attempt to do that in his *Pattern Language* (Alexander *et. al.*, 1977). Vilified by the architectural establishment, this classification has nevertheless won support from the computer science community for its visionary results now used to organize software complexity. When we begin to see the traditional built environment as an extension (an external repository) of human memory, we realize just how intricately biology is linked with architecture. This explains why humanist architects are sensitive to feedback from their design, and respectful to tradition from which they can profit.

The clearest statements of architectural theory have always drawn upon epistemology, being concerned with language and logic (although much of contemporary theory wanders off into meaningless directions). Even so, the enterprise of epistemology is generally detached from evolved human thought, since the latter involves emotion and physiological processes. Sensations and biological states are essential to knowledge, and pattern recognition helps to generate our identity. Truth and reality have biological and social origins. A state of mental understanding is inseparable from the neurobiology of emotions and complex bodily responses. Brain-based reality is thus emotional; a marked difference from its impersonal philosophically-based counterpart.

Culture as a Manifestation of Human Intelligence

Human beings are unique in that they merge their physical and psychological needs. This is accomplished through culturally-conceived expressions that stem from innate urges to make objects ranging from hand-held artifacts and ornament, to buildings and cities. More than just seeking to provide basic shelter, architecture throughout the ages has found expression in the application of these life-affirming urges through human intelligence. The same intelligence produces all cultural elements: dance, music, song, sculpture, and painting. Trying to separate artifacts from the greater context of culture — defined by religion, mythology, and social patterns — goes against the nature of humanity. Complex forms created by human beings are part of a larger, all-encompassing matrix extending human intelligence.

Separation nevertheless does occur, leading to the fragmentation and loss of intelligence stored in the artifacts of a culture. This is exactly what happened during the past several decades, with the propagation of western 20th-Century architectural forms around the world. The problem with this occurrence is that any cultural element separated from its human connection becomes vulnerable to loss of meaning and relevance. Once removed from its cultural context, there is no real (that is, an obviously practical) reason for its survival, or even for its existence as an isolated entity. In this condition of "not belonging", the anchor points of human culture seem out-of-place, and are all too often replaced by meaningless images of industrial consumption.

Creativity, driven by human intelligence, has been the source of the incredible richness of cultures throughout history. Human beings ceaselessly strive to give form to their advancing intelligence in the complexity and organization of their greatest cultural expressions. However, in the last century of human development social, political, and economic dynamics have

begun to erode both culture and identity. In the struggle to demystify the world around us, nature and all that it offers through direct engagement has been supplanted by human ignorance/arrogance. Industrialization may lead to advancement in a society, but it does not advance the culture. The fact that cultural expression satisfies deep inner needs (biological, physical, and mental) has been overlooked in the past few decades, in an effort to clear away supposedly useless relics of the past. People continue to mindlessly throw out some of humankind's most valuable artifacts, buildings, and traditions as if they were cleaning out accumulated junk.

Nowadays, sadly enough, human intelligence is often applied as a negation of itself and of humanity. Some people reject the natural, the simple, and the unaffected as belonging to the past (and thus, to a certain way of thinking, inappropriate for our times). They reject the traditional sources of basic human pleasures upon which many cultural traditions grew. And yet, those simple pleasures are the result of an incredibly complex set of interactions. This turning away from nature and humanity's relation to the physical world is a regression to an overly simplistic (unintelligent) conception of the world.

Cynics observe destruction of the built environment (coupled with a breaking down of human values) with detachment, by not getting emotionally involved. They see a turning away from complex inherited values as an inevitable simplification of contemporary humanity. The more intellectual among them come up with arguments involving "novelty", "progress", and "expressiveness", which serve only to justify their own insensitivity (Salingaros, 2004). Those among us who see a tragic loss for civilization, and try to reverse it, are branded as romantics and conservatives. But far from being either romantic or conservative, people who value human qualities embedded in cultural artifacts are in fact exhibiting a greater sense of intelligent awareness.

Circumventing the illogical but self-sustaining nature of non-humanist practices requires a complete restructuring of architecture, its education and application (Alexander, 2002-2005; Salama, 1995; 2005). So pervasive are the expressions of this soulless contemporary condition, however, that no logical argument can hope to redirect its maddening forms. To date, architecture students and practicing architects throughout the world have had to concede to the dictates of this globalized show of architectural force. Despite the efforts of a growing minority, the confusing proposals of 20th-Century architectural theory continue to lead us down the wrong road (Salingaros, 2004).

Multiple Solutions and Adaptive Design

An intelligent system is able to solve problems. It finds different relationships that lead to a solution, each solution being a network of connections. There is no SINGLE solution to a complex problem, but instead a fairly broad set of related solutions. Systems usually have available many alternative pathways, leading to alternative but equally valid configurations. Biology is marked not by rigid conformity, but by adapting a complex template to changing conditions. Consider the genetic coding for an organism. Siblings of more complex animals, which share genetic information, turn out to

have somewhat different characteristics. It is only in the lowest levels of design complexity that we find genuine organismic modularity: for example, the same virus in a billion identical copies.

This variability is an important component of adaptive architecture. A building designed in an intelligent manner can replace some of its components without reducing the effectiveness of the whole. It is not "unique". It can change itself, just as an organism continually replaces most of its cells as they age, wear out, or die. It can evolve to adapt to changing circumstances without mutating into a totally distinct (identifiably different) typological entity. A similar intelligent solution is certainly possible, so that parts of the building could be changed to shift the overall design to one of its many close equivalents. Historical buildings have been adapted to changing needs over the centuries, and they retain a high level of intelligence (Brand, 1995).

A reader might get the wrong impression of a "perfect" building in which nothing can be changed. In an intelligent building, each component supports overall coherence by making an observable contribution to the whole. The building can be changed, sometimes drastically, by replacing components, as long as they continue to support the overall coherence (analogous to the wholeness of an organism). It is this systemic connectivity that is important — the end result of an intelligent process of solution — and not any individual piece (although some pieces are more crucial than others). Any successful adaptation to changing circumstances and uses preserves a high degree of internal relationships that characterize coherence.

Adaptivity is impossible without intelligence. The system has to respond to a multitude of forces in the environment (for buildings these are human needs and sensibilities, surrounding buildings, natural features, etc.). It must compute a set of valid solutions that satisfy those forces, otherwise it will perish. The extra-adaptive constraints imposed on the problem (such as budget, availability of materials, building regulations) choose from among the possible good solutions. All of these decisions are based upon interactivity and reasoned choice from among many alternatives, each of which has to be evaluated using criteria of adaptivity.

Formal designs, by contrast, are far more restrictive. The opposite of an intelligent process is to impose a preconceived solution based on some formal criteria (such as a fixed compositional method of simple geometries). Formality and adaptivity are incompatible. In a formal, iconic building, each component has to conform to a fixed abstraction, so it may be impossible to change or substitute a single piece (but this is the opposite reason from why one cannot change a component that contributes to overall system coherence). An iconic building usually cannot adapt to changing circumstances. It was non-adaptive to existing forces when it was conceived and built, and remains non-adaptive to all new forces developing in the future.

Intelligence as a Model for Architecture

Nature has evolved an enormously complex neuronal system that enables the formation of thoughts, and couples it to our body, which then executes the results of the intelligence mechanism. Input to the human intelligence system comes both from our sensory system

(connecting us to the external world) and from internal memory. When the neuronal system is active (which is all of the time, even in sleep), connections are made, patterns formed, and new links and conclusions emerge. This system has enabled us to successfully lead our lives over millions of years, adjusting remarkably to changing circumstances and habitats. Human adaptability is one of the marvels of nature, and it is due primarily to human intelligence.

People build traditionally according to what their mind tells them consciously and subconsciously, unless they are copying an explicit image. The brain guides the hand and eye in an intelligent, self-correcting process. Emergent forms, spaces, structural elements, ornamentation, etc. are just as much a reflection of the human mind as they are products of utilitarian functions. That, at least, was the case until the twentieth century, when iconic formalism was substituted for physical and emotional needs. By dismissing the expression of innate patterns in the mind, an iconic architecture detaches itself from human intelligence.

Let's not confuse intelligence with intellectualization. Intelligent architecture seeks to give unaffected form to what the human mind needs to allow it to engage with the material world. Once constructed in these terms, the mind transfers ordered information to a mental extrapolation of this experience. If instead this becomes an intellectualized conception, then the experience is illusory (fictitious). America can pride itself in creating some of the most intellectual and thus inhuman spaces ever conceived, but to what avail? Since these places are so unsettling that no one wishes to occupy them, they have become nothing more than symbols of this intellectualized condition.

Architecture still remains a mystery to most people, just the way rational thought was a mystery during the Dark Ages of human existence. This lack of an intelligent relationship between people and architecture has for too long been the terrain on which *starchitects* operate. Human beings today are smarter than our species has ever been; therefore, it is unacceptable that architecture continues to be rendered in a semi-mystical fashion. Architects are still necessary to guide and mediate the design process to help the client, but non-architects need to re-assert their right to access the body of architectural knowledge. When they do so, they will demand a far greater clarity of understanding than architects themselves accept today.

Thus far, the powers that lead society have not been very intelligent about creating the contemporary built environment. By stubbornly sticking to a narrow set of images, they perpetuate the same "dumb" typologies that architects have been following ever since the 1920s. Even more astonishing is how vast technological power is now applied to continue producing these "dumb" typologies in an ever-narrowing spectrum of variations. Here, surely, is a misapplication of technology to support an obsolete stylistic "look" instead of generating an infinite variety of new adaptive possibilities. But then, technology has periodically been misused because it lacks an innate mechanism for selection. Whoever applies the technology can either use it for progress or to arrest progress.

Extremely expensive high-tech buildings are erected, which turn out to be perfectly "dumb"

as far as providing an intelligent and sensual treat to the user. Their form and surface offer no surprise, no contained information, no anticipation of discovery, and no variation from certain expected stereotypes. Contemporary buildings still follow the minimalist typology in some way or another. They are either unrepentantly and intentionally boring, or they try to distinguish themselves with an initial shock. We receive a thrill (a surge of adrenaline) from an unexpected, shiny, exaggerated, or unbalanced form. After this first statement of defiance to the dull modernist aesthetic, however, there is nothing further to communicate. The architectural shock is empty of meaning, just as much as the message from competing minimalist structures.

Iconic Versus Human Architecture

Building in a way that utilizes scientific ideas and knowledge can once again make architecture a great HUMAN achievement. A new building constructed according to intelligent methodology benefits all its users in a direct, nourishing, and visceral manner. If they wish, architects can now utilize this knowledge to fix their designs positively to human physiology. The public loves a great building (be it a historic building, or a new building that exhibits this intelligence) when they feel in harmony with it, and when it reinforces their place in the world. It is a joy to look at, and everyone engages with it as an equal participant, since it establishes a fundamental parity between user and architect.

By contrast, an architect seeking only to garner public attention hopes that everyone will revere his/her building for iconic reasons, as spectacle, with the user subjugated to the greatness of the architect. The "star" system of design makes a building the achievement of a single individual based on his/her personal preference or whim. The public might still seem to admire such a building, but only because some "expert" declares it to be a great work of architecture. This manufactured admiration does not arise internally. Personal whims and stylized expressions serve only to distance the user from the architecture, because they negate the greater spectrum of neurological connections.

Science has been co-opted and utilized in only a superficial manner, to generate non-adaptive iconic expressions (Salingaros, 2004). Young architects live with great disappointment, finding themselves in a career that places a greater value on imageability than upon inherent human qualities. While pretending to uncover new architectural principles, charismatic *starchitects* instead cultivate media attention and political connections, court the influential critics, and assume an aura of aesthetic refinement. This is how they continue to garner the most significant architectural commissions of our time; it is not from any real concern for civilization.

The global business-industrial complex has identified itself with a narrow architectural style. Ensnared in the western paradigm where the perception of architectural novelty is mistaken for progress, many countries have fallen victims to this image-based architecture, further encouraging the commodification of its form. The official media imply that it is somehow better than what is deemed non-modern. As each new architectural frenzy fades, its telling marks will be forever imprinted on those

who have to live and work in the shadow of its products. If we look more closely at the phenomenon of "signature" architecture we will see that, contrary to its claims of giving greater significance to "place", it actually works to subvert a true sense of place through a loss of identity. When considering cities with "signature" buildings in the developing world, what comes to mind first are those buildings' images, not the people and places that constitute the real culture of these localities.

In our times, the effects of the global economy are undoing the magnificent expressions of 5,000-year-old cultures in the rest of the world. Western interventions negate the identity and values of people, in effect cutting them from their sense of belonging in the world. Human architecture is informed by its material presence, not by image, yet our technological resources are focused on replacing civilization by images. Larger economic interests are using *starchitects* as part of their drive to profit from the rest of the world, displacing cultural and ideological values in the process. Rather than helping civilization toward the ultimate expression of our own time and place, this application of advanced technology serves only their own interest.

Everyday people intuitively perceive contemporary architecture and urbanism to be disconnected from and opposed to traditional human values that they hold sacred. Many see the destructive process of 20th-Century architecture as a combative gesture towards all traditional cultures, their values, and beliefs (Salingaros, 2006). Such practices present an affront to many religions and cultures, by negating the forms of their architectural expressions. So-called modern forms counteract the basic principle of connecting an individual to the universe — hence to God — through a more traditional incorporation of color, sculpture, and calligraphy, in effect denying sensory connections. Temples, mosques, and churches conveying meaning via polychrome sculptures, tile work, reliefs, frescoes, and mosaics have no place in this sterile and "industrial" world order.

Governments that seek international recognition by way of hiring *starchitects* must be made to see that they themselves are complicit in negating the inherent values and knowledge of their own citizens. Architecture as a "will to form" was never concerned with engaging the user in a positive manner. It is an architecture of spectacle, purged of its need for meaning and context, which has been allowed to construct its own reality. Its realization negates other forms of sensory perception necessary for the human dimension of lived experience.

For several decades, modernist architects have turned away from traditional forms of tectonic expression. And yet, it has been found that the underlying relationship that people have with the physical presence of architecture comes from the material and phenomenological dimensions of such work. It cannot be denied that in the past, superficial decoration departed from empirical evidence of physicality, but that was more a product of an aesthetic impulse unchecked by the limited science of the times. Today we have the scientific knowledge to head off such deviating forms, not because of style, but because of their lack of perceptual coherence (Salingaros, 2006).

In this era of globalization, advanced knowledge

that only contemporary science can provide is readily available to everyone. The new paradigm in architecture links traditional models and typologies with the biological structure of human beings, and the physical structure of the universe (Salingaros, 2004). Developing countries, in an effort to maintain their place in the world, will instead find the source of their new architecture within arm's reach: in the materials and practices of their region. Through this record they will understand the underlying principles that govern the manner in which the physical world reveals itself. Hopefully, they will recognize at once its capacity for new honest expression. Honest and authentic generative devices evolve with an uncanny similarity to the rich vernaculars of their local traditions.

Expectations of Perpetual Novelty

How does one distinguish between contemporary architects who will likely have a positive or negative effect on the environment? Who is egotistical/iconic, and who is humanistic/adaptive? All architects claim to be genuinely interested in humanity, so what they say cannot be used to judge either their intentions or their products. Ashraf Salama made a perceptive comment about this: "*I wish I could see famous architects able to solve a housing problem in a village or in a dense urban region, or able to introduce change in a poor community, or a squatter settlement. While famous architects are immersing themselves in exploring new innovations to foster their fame, two-thirds of the world's population lacks shelter or lives in substandard houses.*" (Salama, 2003). Champions of adaptive architecture are actively involved in designing urban settlements and social housing, whereas *starchitects* are conspicuously absent.

Since early European modernism, the western expression of architecture has been on a roller coaster. Minimalist modernism reduced expressions to a single typology, severely reducing freedom of architectural expression — a statement that can be mathematically proven! (Salingaros, 2006). The point where we find ourselves nowadays is different, but not much better. Everyone is caught up by the western phenomenon wherein *starchitects* promise a new architecture hyped by the global media.

The legitimization of form over content, however, seen in pedagogical positions going back to the Bauhaus, serves only to validate an architecture of appearances. Detached from the world of lived experience, architecture as image reveals itself as nothing more than a fashionable commodity. As such, it is subject to the rules of constant change characteristic of the fashion marketplace. This type of architecture cannot respect the physiological needs of human beings. Looking around us verifies that these recent architectural practices have effectively erased the design and building traditions of the past, and with them the vital web of urban culture in society. Introducing such abstractions during the twentieth century had catastrophic consequences for our cities' urban fabrics, and for the human qualities of individual buildings (Salingaros, 2005). With each structure removed to make way for the modern world there was a loss of intelligence embedded in the built environment.

Left unchallenged, this phenomenon continues to perpetuate itself by way of its global imageability. Following closely in its wake is the endless and empty rhetoric of

contemporary architectural theorists. Looking outside architecture as a means to garner greater validity, their speculations have run the full gamut from misunderstood mathematics, to the poorly-conceived postulates of French philosophers, to the loosely-construed intimation of linguistics into the domain of architectural design. Each new "theory" offered yet another invented way to conceptualize architecture in the absence of an intelligent basis, and thus failed to provide everyday architects with any intelligent tools for architectural innovation. In a market driven by the architectural media, *starchitects* have set unattainable standards (because those rely on unrealistic expectations). Practicing architects, expecting this work to elevate our profession, are beginning to sense that it only serves to propel the *starchitects*. And in the process, it has made the job of real-world architects working with real budgets and real clients impossible.

It is incredible that teachers of architecture give their students incomprehensible texts written by *starchitects* (and by architectural academics who wish to bask in the fame of those *starchitects*) as something useful to study. In a frenzy that idolizes anyone promising "new" forms, students are compelled to read this stuff. One prominent *starchitect* today uses pornography to sell his otherwise nonsensical books. Yet he, and other individuals like him, are continually rewarded by lucrative commissions, choice administrative and faculty appointments at our most prestigious universities, gold medals, and major architectural prizes. That visible success naturally justifies students reading such intermittently salacious texts with great attention. The students get the message: copy these tactics and you too can become a *starchitect*.

Ideas of style have a stranglehold on contemporary architecture. The pursuit of the "theoretical", which has obsessively driven the architectural world since early modernism, has given us little that strengthens the human lived experience via the built environment. Despite all the rhetoric declaring that this architecture was responding to profound social, political, and scientific discoveries, it in fact was driven by a rather narrow agenda. Over time, the imposition of an identifiable (signature) style became the road to recognition and power. This has nothing to do with human needs and sensibilities, but everything to do with successful marketing. Its phenomenal success is due to the continuous mutation of the original industrial style so as to keep its practitioners comfortably in control of both architectural practice and education.

Conclusion

A creative revolution is now possible, one that will transform the built environment in wonderfully human ways. A new intelligent architecture can impart a greater sense of humanity to the city and to the world. It is up to world architects to set into motion some of the greatest scientific ideas of our times, and make architecture once again our highest cultural expression. Architecture that emerges out of an intelligent process of interactive thinking naturally develops towards a design adaptive to human beings. It is better fit for human habitation because, coming from what is human, it nourishes our sensory needs and sensibilities.

To survive globalization, our civilization must be

grounded in an intelligent understanding of "place". The powers that shape our countries have a responsibility to not allow international designers a free hand to make a spectacle of a region's place in the world. This is not to say that collaboration should not occur. Tremendous knowledge can be gained through cross-cultural collaboration with those who have an understanding of intelligent architecture. They can help local architects create new adaptive forms that re-establish a vernacular specific to their own culture; i.e., an architectural language that speaks to the citizens of each country. Restructuring architecture to resonate from within the rich history of human societies will provide a greater meaning in people's lives and a sense of belonging to their collective spirit.

The main obstacle we see facing us is that of institutions (organizations, governments) validating non-humanist architecture. Seduced by the latest fashion, they are eager to commission the current crop of *starchitects*. Whether this choice is due to a misguided conviction about High Art, or clever global marketing that preys upon hidden feelings of cultural insecurity, the result is disastrous. The international press will repay their expense with praise for the "enlightened" country sponsoring the latest "signature" building, but that is part of the marketing strategy. It's only a token reward to the sponsor's ego. The long-term reality is far darker. For a brief moment of publicity, many precious (and irreplaceable) commodities have been sacrificed, beginning with the sensibilities of that country's architects, and ending with the country's historic culture.

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POLEMICS IN ARAB ARCHITECTURE: THEORY VERSUS PRACTICE

Khaled Asfour

Abstract

There is a great divide between academic field and professional practice. In many Arab countries academics are advocating traditional architecture in a "traditional" way. They believe in image cloning and visual abstraction from history. However, because of rising competition, architects in the market are giving what the society aspires for: modern architecture. This polemical practice has not yet penetrated the thick skin of academics. Yet, new identity is in the making contrary to what intellectuals and officials would like to see. No more direct cut and paste from history. Common practice that strives for Identity today is more or less tall buildings with curvilinear glittering planes. Less common, is the one that is slowly germinating from environmental awareness which in turn touches upon traditional values in a subtle way. More interestingly, the less frequently practiced type of identity is proving profitable ventures for their clients. Investors are gradually accepting the new language for it brings them prestige. In this research, two villas, one apartment building and a university campus introduce traditional values in a disguised way showing innovative solutions that will slowly turn the current practice into a better future for Arab cultures.

Keywords

Divide, tradition, modern, disguise, environment

Introduction

During the early eighties Arab intellectuals started to criticize their own version of Modern Architecture. Debates suggested, particularly in the Gulf region, the restoration and recycle of traditional architecture as a way of inflicting character upon the city. Old palaces were refurbished to become museums and visual references for current practices. Large-scale commercial projects, developed around historic cores such as that of Kasr Al Hokm in Riydh (1992-98), or developed around waterfronts such as Suq Sharq in Kuwait (1998), are examples of mega projects that used traditional imaging to impress the society by their origins; and in the process boast their marketing profile. Many government offices followed the same approach representing the official heritage of the place.

With such focused traditionalist campaign Arab intellectuals hoped to cause tidal wave of influence on the rest of the community. However such influence hardly materialized

despite architectural excellence in some cases! (Fig 1). The paper will show the schism between what ought to be and what actually is. Ideal theoretical positions in architecture schools do not match real practice. Through examples that are widely acknowledged in their hometowns, the paper identifies architecture trends in the Arab world that can suggest future positive trends and perhaps bridge the gap between theory and practice.

Figure 1: Suq Sharq, Kuwait.

Intellectual Isolation

It seems from the prevailing practice that there is a strong cultural mechanism of "social aspiration" towards the western model that rejects the saga of heritage cloning. Despite all intellectual arguments about why Arab cultures should return to their urban traditions, these large public projects dressed historically failed to give the contemporary urban fabric an identity among its inhabitants. They became isolated events, despite their scale, that were not inspiring the masses. (Fig 2).

Contrary to the wishes of intellectuals, what proves to be successfully vibrating with the society at large does not exist in their debates. "Return to tradition" (1) was an exciting new motif during the eighties in the Arab intellectual world. These arguments about visually abstracting history in a modern way still exist today surprisingly among new generations of intellectuals, and even editors of magazines. They cannot break the code of stagnation. It became a sort of an official position for academicians in front of their students.

Figure 2: A Typical Isolated Event: A High Rise in Abu-Dhabi.

When students graduate they find a different attitude among society and nobody tells them why this is the case. What they know is that the academic zeal for tradition is ideal, and what is outside in real life is contradicting and hence corrupt.

What they don't know is that those academicians have succeeded in further isolating future generations of professionals from their cultures. Those academicians refuse to see their contemporary cityscape as produced by their societies and prefer to live in the cyberspace they have imagined hoping one day the latter replaces the former.

Only few Arab cities noticed the problem and searched for identity elsewhere that satisfies social aspirations. They redefined the term as not an immediate reference to tradition, but rather high-tech imaging of classical and modern architecture. The easiest way to practice the alternative approach is to erect a very tall building showing signs of modernity to be easily identifiable from all over the city such as Mamlaka tower of Riyadh (Fig 3).

The ninety - nine- story tower is not a typical matchbox architecture. It has only two facades curved out forming almost an ellipse in plan. What distinguishes it is the large half elliptical hole piercing the upper forty percent of its floors. The new form talks to everyone. A cab driver will proudly tell you about it if you are a visitor for the first time. It is simple and easily reduced to a logo, so that it registers firmly in the public's cognition. In no time it became the city's landmark.

City's landmark means good profit for the owner. It is now the most expensive office rental in Saudi Arabia. Even when economy is not at its best, multi-national businesses cannot afford to leave the tower since it is becoming part of their image making.

High tech imaging succeeded in reassuring Arab societies that latest version of modernity or western classicism with a bit of novelty is part of their cultural landscape. They travel abroad and see it fashionable, they identify with it. On possessing it they understand its impact on their surrounding neighbors. It gives them prestige and a window with a view on the advanced world.

Figure 3: Al-Mamlakah Tower in Riyadh, An Example of A High Tech Imaging.

The Financial Harbor, Manama, Bharain

The Bahrain Financial Harbor designed by Ahmed Janahi is another excellent example (under construction). To achieve distinction, the architect created curvilinear planes, slanting rooftops and staggering facades for all his buildings. By this he achieved collective character and hence a powerful image for Manama. Lagoons penetrate the heart of

the project tying all buildings together thus further strengthens its collective character. The project became a small Venice with plenty of waterfront to host leisure and business activities (Fig 4).

Unlike many landmark projects such as Burj al Arab of Dubai that are usually tailored for the urban elite Bahrain Financial Harbor is fully opened for the community at large. They will find shopping boulevards along the waterfront, marina, water taxis, restaurants, coffee shops and opera house. All those activities infiltrate within the business oriented buildings such as, a stock exchange center, insurance companies, financial enterprises, hotel, upscale apartments, and media center.

Figure 4: Bahrain Financial Harbor, Designed by Ahmed Janahi.

The Bahrain project did not only create large water frontage but equally large garden area along its side. This means that the public along with the professional community will view the landmark ensemble through endless vistas of the garden. People strolling through the garden or along the seafront using various facilities, will be amused by the changing panoramas; for buildings vary in height, mass and orientation. The project becomes their city icon, their image in front of the rest of Gulf States, their pride to the outside world (Fig 5).

Figure 5: Bahrain Financial Harbor Designed by Ahmed Janahi.

Many Questions Evolve:

The Bahrain harbor and Saudi tower no doubt succeed in responding to social aspirations and dreams. However, they raise many concerns. What are the sustainable qualities that should be associated with foreign ideas on entering the hosting culture especially those pertaining to energy consumption?

What is the environmental impact those ideas cause in the new setting and how can their negative effects, if exist, be reduced? What is the running cost of those ideas and how it affects the average citizen on a daily basis? Can there be a niche within social aspirations for traditional ideas that are still valuable for today's culture? If the answer is positive how it can be introduced to the culture without facing resentment? All these concerns are not part of the cultural debate. The public is unaware of them; let alone understands their implications or finds remedies. Nevertheless, they still search for architecture of reassurance that is beyond their traditional sphere.

Wisa Wasef, Giza, Egypt

Forty years ago, Wisa Wasef was the first person who tried to find a traditional niche within social aspirations. He believed the return to traditional building construction is a way of life and not just architecture. In Harania Village, Giza (1957-74), he built villas for his family and farmers using natural materials such as mud bricks and wood (Fig 6).

Figure 6: Traditional Dome at Harania Village.

He taught farmers how to weave carpets using rural landscape as their sole theme for carpet design. The rural community realized for the first time that its authentic setting is a lucrative source of income and hence worth respecting and preserving (Fig 7).

The rural community elsewhere in Egypt has abandoned traditional construction for the sake of modern concrete buildings that is far less efficient when it comes to environmental measures. By linking the rural setting to their source of income, farmers trained by Wisa Wasef realized that social aspiration must include their indigenous built environment. Their carpet design became world famous and their village became a landmark in Egypt proudly presenting its authentic image (Fig 8).

Figure 7: Harania Village, Designed and Developed by Ramses Wisa Wasef.

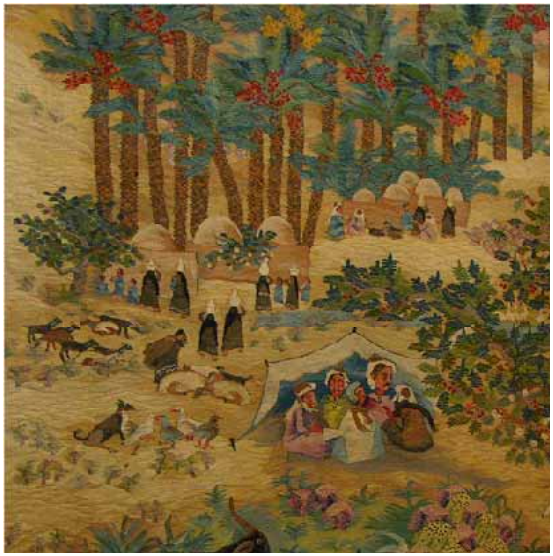

Figure 8: Carpet, Designed and Manufactured by Farmers at Harania Village.

Tradition Disguised: Alayli –Amawaj -Nammari

If Wisa Wasef succeeded with his farmers can architects succeed with their urban elite clients? Only few architects today succeeded in introducing traditional ideas as a niche within social aspirations. They realize that if authentic ideas has a chance to survive it needs to be disguised and diffused within the aspired vogue so much desired by Arab societies. Their works represent the future trends of architecture in the Arab world, since it is the kind of architecture that is attractive to the society and has a peaceful dialogue with the environment.

Alayli Villa - Alexandria, Egypt

Mohamed Awad, the architect of Alayli villa in King Maryout, Alexandria (1995), included a major traditional space, the courtyard. However it has a different connotation. In the past the court is mainly a circulation space tying one corner of the house to the other; it is a buffer space that separates the living quarters from the guest reception areas. It is also a place where there may be an attractive fountain to be remotely appreciated by family members and guests alike sitting in adjacent spaces. In Alayli villa, the court is an activity space in itself. Family members together with their friends can enjoy the swimming pool and the Jacuzzi bath that occupy most of the court (Fig 9).

It is a space that invites spillover of activities for it directly opens to the garden through glass panels where there is another pool for outdoor swimming. Between the two water activities there are plenty of sitting areas partly inside the court partly outside the garden for daily interaction. This in-between space is what makes the court so transparent to the outside world thus marking the modern lifestyle of the family (Fig 10).

The space in this way holds far less privacy connotation than it used to be in history, it does not separate family living from outside world, in fact it is a smooth transition. Complimenting such smoothness is the diffused natural top light filtering through a large perforated wooden dome that covers the courtyard. In this way intensity of light in the court is comparable to that of living spaces surrounding it; thus further departing from the traditional essence and getting closer to contemporary lifestyle of a modern family (Fig 11).

Figure 9: The Courtyard of Alayli Villa Acting as a Socio-Spatial and Climatic Modifier.

Figure 10: The Transparency of the Courtyard of Alayli Villa Marking the Modern Lifestyle of the Family.

b.

a.

Figure 11: a) The Spatial Interior Environment of the Family Living Space at Alyali Villa, b) Perforated Wooden Dome Allowing for Proper Lighting.

Al Nammary VillA-Al-Khobar City, KSA

Another architect who introduced traditional forms in a new manner is Mohamed Abulnour through his villa design of Al-Nammary in Khobar city (2000). Unlike Alayli villa, privacy is one of the major factors affecting the courtyard design. Usually in this region, residents build party walls two stories high to provide privacy for open-air swimming pool located in their backyard. The feeling of imprisonment cannot escape those typical outdoor spaces (Fig 12).

However, in the case of Al-Nammary villa, the courtyard has one side opened to the back yard only at the ground level. The upper floor is raised on columns, allowing for cross ventilation of the courtyard, and is a visual barrier to the surrounding neighbors. Villa residents can now use the pool in the courtyard with extended view to the back garden without being threatened by their neighbors' proximity. In this case the architect retained the original meaning of the court but changed its shape- (Fig 13).

The pool with an extended view towards the garden becomes a good pretext for placing the family living in front of it. Furthermore the space takes the NE orientation, which is ideal for hot climates. The family living, being the most usable space in the house, follows the idea of classifying spaces into important and less important giving the first group more autonomous status with freedom to rotate in any direction in the site searching for best view and climate while disregarding the initial geometry of the land. Such idea is a design approach so much practiced in traditional houses, which enable dwellers to make best use of their local environment.

More of this approach is evident in Al-Nammary villa. Natural soft light fills most of the essential spaces of the villa by adopting another

Figure 12: A Courtyard with a Central Pool at Al-Nammary Villa, Designed by Mohamed Abulnour.

Figure 13: The Living Space Opened to the Courtyard and the Swimming Pool.

traditional element. The architect added clerestory windows located in vault structures surmounting the roof. As a result, the curved surface of the vaults is lit and in turn becomes a source of indirect diffused light to the whole interior. This is suitable for hot climates that forces residents to close wall openings with shutters or curtains for most of the day to avoid direct glare (Fig 14).

The villa as whole through its detailing and syntax is absolutely Modern fulfilling the wishes of the client, but the quality of living recalls traditional standard that is proven throughout centuries to be the most sensitive towards local environment.

Figure 14: Interior and Exerior Views Showing Clerestory Windows Accommodated in the Roof Vault Structures to Allow for Indirect Diffused Light.

Amwaj Residential Tower – Kuwait

Yet making use of traditional dwelling need not be limited to courtyard design. This conclusion is valid in the case of residential high-rise buildings in which courtyard design is increasingly difficult to adopt. In this case traditional ideas are focused on environmental qualities (Fig 15).

Option One International decided to adopt this approach through their design of Amwaj Residential Tower in Kuwait city. The land was large enough to place the tower in any direction. Since the floor-area-ratio (FAR) is constant, the conventional wisdom would be to minimize the number of floors and maximize the number of units per floor. This would have meant the placement of considerable number of units towards the west and south using a double loaded corridor arrangement.

Option One discarded such common alternative by arranging the units on a single loaded corridor with the units facing north; while the corridor, stairs and elevators facing south. This situation is plausible since all the living and reception areas and most of the master bedrooms face north (Fig 16).

Figure 16: Orientation of Main Spaces Toward the North.

Figure 15: A Conscious Attempt at Introducing Environmentally Responsive Articulations.

With this arrangement, they had to go for a high-rise instead of a low-rise building achieving the same floor-area-ratio. Although this meant 20% increase in construction cost and 12% longer in construction time, nevertheless, there was less dependency on mechanical means to cool the space during hot months. On reviewing the sides of the tower, it becomes clear that the North façade has the highest concentration of glazed surface. The west façade, being the worst in hot climate, is almost solid. The east

façade has more glazed surface than the west since it is commendable to allow early sunrays of the morning to flood the bedroom spaces and unlike the west, the east sun makes short morning visits any way. The south side has conservative openings on the few bedroom spaces situated in this direction; otherwise, standard small openings are for service areas. The final outcome is that the four sides have different façade treatments directly influenced by climatic considerations, which is something so rare in tower design, particularly in the Gulf (Fig 17).

Figure 17: Treatments of Northern Facade, Direclty Influenced by Climatic Factors.

That is not all. The designers looked for additional means to reduce energy consumption. They used high performance double glazed panels that save energy by 10% during peak load if compared to normal double glazed panels. More important, they adopted wheel type heat recovery system that tends to absorb the coolness of the exhaust air only to cool down the fresh air intake. This in turn reduces load on the chillers. The energy saving from this system is 19% during peak load condition. Total energy saving is 29%. If we add to this number the fact that the units are oriented to the north and not to the west or the south, that amount of energy saving becomes even higher.

With all those green measures, did the building pay off when introduced to the real estate market of Kuwait? Despite its high initial construction cost, apartment units were renting with a high rate at an early stage of development at a much higher rent than was preliminary estimated. In fact it turned out to be 30% more profitable than if the building were double loaded with apartments, half of which would have been facing wrong orientation.

In light of this analysis, Amwaj tower design answers the worrisome position of academicians who believe that the only way to revive tradition is by visually recalling traditional forms in contemporary architecture. By adopting basic environmental ideas found in traditional architecture through high tech applications, the tower became very attractive to the society causing demand to soar high up in the blue skies of Kuwait. Today rental value of Amwaj apartment is between 1500 to 1800 KD per year while neighboring apartments are rent for 800 to 1000 KD.

The American University in Cairo, Egypt - AUC

Do architecture curricula promote this kind of examples in our part of the world? Very few! Does anybody tell the public about those success stories? Shall we continue leave the society run after its aspirations in a damaging unsustainable format? What if we use community-based projects as a vehicle to inform the public about traditional values rather than forms?

A project that attracted the public to its base then presented environmental values stemming from tradition is the new campus of the American University in Cairo.

Abdel Halim Ibrahim, the "Prime architect" together with Sassaki, had the intention to revive the university tradition of interacting with local community. He envisioned the space in front of the main entry portal to become a park that provides the potential for community interaction with AUC members. The park is a space full of activities that can be of interest to the public (Fig 18).

Figure 18: A Park in Front of the Main Entry Portal of the New AUC Campus.

The scheme suggested the location of Performing & Visual Arts Theaters (PVA) right beside the entrance portal overlooking the park. The Black Box theatre, an experimental theatre that is part of PVA, has an octagonal projection for a single artist to perform in front of the public. Another octagonal projection is at the other side of the PVA to display art objects, also for the public to appreciate. The main auditorium located in between, has an entrance porch projecting with vegetation to keep its audience posted with current events of the theatre. A curved wall, full of openings for the public to peak their heads through and watch those on-display activities, gives partial privacy to PVA and acknowledges its integrity as an academic institution, such privacy increases as students and faculty staff walk towards their courtyards and classrooms located behind the theatres.

Beside the PVA is the university bookstore with display windows to show latest publications released. Adjacent to the bookstore is a coffee shop that offers refreshments and snacks to serve the visitors of the park. At the other side of the square is another projecting octagonal space acting as information center and registration booth.

Other outward oriented activities that can enhance the public life are occasional used book fairs as an extension to library functions, in addition to various faculty activities such as conferences and exhibitions. Among future sites around the park is that of a museum for Hassan Fathy archives to commemorate the first Arab architect in modern history to advocate sustainable standards in architecture.

As if all this was not enough to enrich the cultural life of the surrounding community, the architects introduced an amphitheatre setting in the middle of the park for additional activities that can attract the public.

To ensure that great number of people can come to those activities from all over the city, the Cairo Underground Metro will erect a station right beside the park. The architects from their side provided shaded parking lots that can hold over four hundred cars.

By the time the community gets preoccupied with park activities, Abdel Halim will have introduced in the same space some environmental ideas pertaining to tradition. He provided a comfortable environment throughout the square by covering it with a palm grove composed of three hundred and sixty palm trees. This high concentration of palms recalls favorable microclimate conditions that used to be available in open spaces during the classical era of old Cairo (Fig 19).

The palm grove is easily identifiable from far away. All around the site a stream of trees on various terraced planes are planted to cover parking lots or compose a protective belt from undesirable desert winds. The message is clear. The local community should quit the bad practice of disregarding the living requirements in a desert climate. Instead of defusing the harshness of the desert environment by mechanical gadgets all the time, they should think of exploiting natural sustainable means first. Instead of planting gardens as vast lawns and shrubs, they should think of creating shade through clustering of trees and palms. When

the public use the park and realizes the drop in temperature during summer due to the clustering of palms then return home to use mechanical means to reach the same coolness of the park they will understand for the first time that something is wrong in the built environment they are living in.

The environmental message continues beyond the park. Visitors entering the main gate looking straight ahead will find a long spine of palms, trees and water bodies all forming an impressive stretch of lush green panorama. To the side of the entrance, another axis, bending its way around the green panorama, includes a string of courtyards around which all the administrative and academic buildings are gathered. The two spines converge to greet the students housing and athletic zone at the end of the campus. Placing the university garden in front of the main portal while the academic spine on the side shows the great extent AUC focuses its public image on green ideas rather than buildings (Fig 20).

Friendliness to the public and the environment becomes the most significant statement a foreign university can offer to the surrounding milieu; hopefully it can influence other public institutions of similar nature in the vicinity to follow suit.

Figure 19: Three Hundred and Sixty Palm Trees Simulate the Classical Era of Old Cairo.

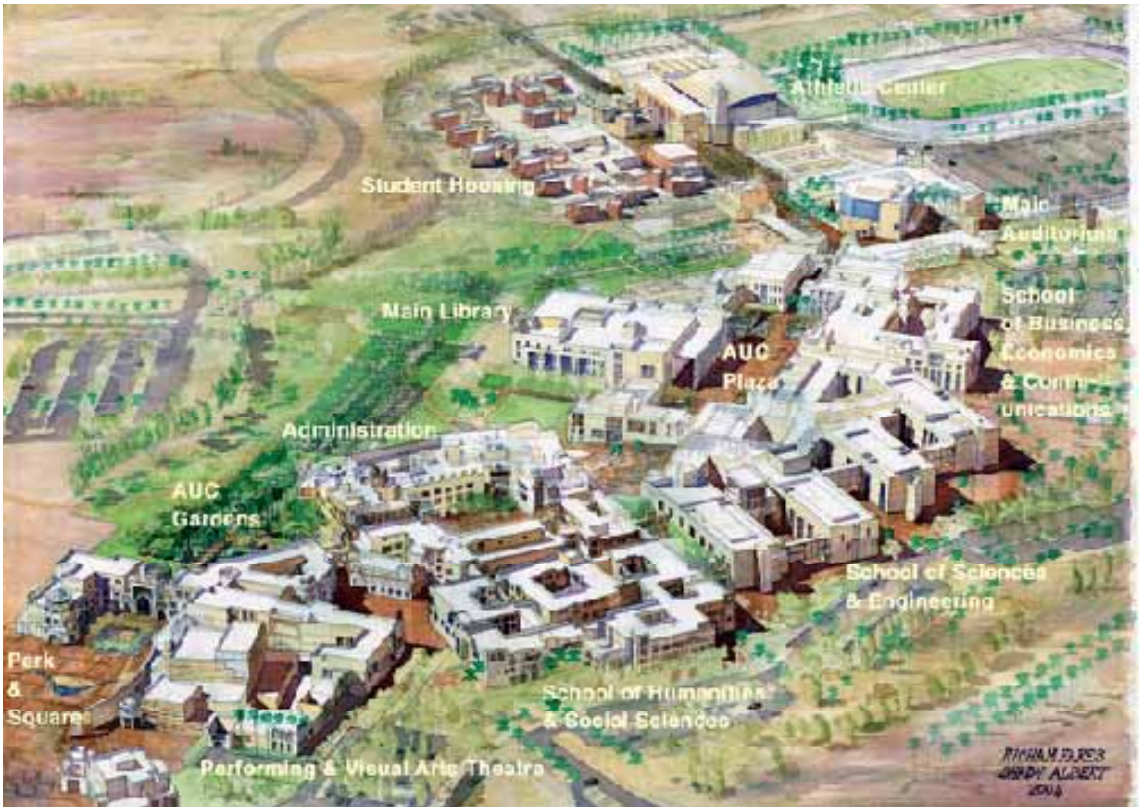

Figure 20: The Focus of AUC on Green Ideas is Reflected on the Design of the Master Plan.

Conclusion

On reviewing the selected projects it is evident that the architects have accepted the social aspirations of their clients in terms of giving them prestige through modern distinguished images. The source of distinction, surprisingly, was coming from historic practices in disguise filtering through the modern images. The latter became a sort of an introductory card for the former, which otherwise could not have been admitted in the web of social aspirations.

In many Arab countries academics are advocating traditional architecture in a "traditional" way. They believe in image cloning and visual abstraction. However, because of rising competition, architects in the market are giving what the society aspires for. This polemical practice has not yet penetrated

the thick skin of academics. Yet, new identity is in the making contrary to what intellectuals and officials would like to see. No more direct cut and paste from history. Identity today is slowly germinating from environmental awareness which in turn touches upon traditional values. More interestingly, this type of identity is proving profitable ventures in front of their clients. Clients are gradually accepting the new language for it brings them prestige. Introducing traditional values in a disguised way within ultra modern imaging is a polemic that will slowly turn the current practice into a better future for Arab cultures.

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HYPER IDENTITY: THE CASE OF KUWAITI ARCHITECTURE

Yasser Mahgoub

Abstract

This paper focuses on the mutual relationship between cultural identity and the built environment. The questions paused by this paper are: what aspects of cultural identity change and how do they impact architecture and the built environment? And, in return, what aspects of architecture and the built environment change and how do they impact cultural identity? The paper aims at understanding the current struggle to be modern and to return to the roots at the same time in different parts of the world. It focuses on Kuwait as a case study of this struggle. It starts by analyzing the cultural transformation that occurred in Kuwait during the 20th century under influences of economic and global changes, and then examines recent attempts at the beginning of the 21st century to reflect a cultural identity in architecture. The paper utilizes the method of analysis suggested by Zavalloni to understand the identity creation, formation, and transformation. This method provides a theoretical understanding of identity as a system. Several research studies were conducted by the author to understand the extent and the meaning of the phenomenon of expressing cultural identity in contemporary Kuwaiti architecture by utilizing elements from traditional Kuwaiti architecture. The paper concludes that cultural identity is a meaning making process, multiple identities exist at the same time and transforms from one state to another adjusting to external pressures and circumstances. The paper recommends that when searching for cultural identity, one should expect to find several overlapping identities. In sum, a more open-ended approach is required when studying cultural identities that stresses the *hybrid* and *hyper* nature of culture identity; a hyper-identity.

Keywords

Architecture, built-environment, culture, hyper-identity, Kuwait.

Introduction

Manuel Castells (2004) states that "the construction of identities is fundamental to the dynamic of societies" and that "cultural identity is the process by which social actors build their own meaning according to cultural attributes." The paper focuses on the mutual relationship between cultural identity and the built environment. The questions addressed by this paper are: what aspects of cultural identity change and how do they impact architecture and the built environment? and, in return, what aspects of architecture and the built environment change and how do they impact cultural identity?

YASSER MAHGOUB

The premise of this paper is that there is always a cultural identity expressed in the built environment and that there is a mutual relationship between culture identity and the built-environment; as one changes it impacts and changes the other and in return impacted by and changed by the other.

This paper discusses the concept of hyper-identity as it relates to architecture and the built environment in the Kuwaiti experience. It focuses on the transformation of cultural identity and its reflection on architecture and the built environment in Kuwait. The case of Kuwait provides a good example of rapid transformation experienced by other cities in the Gulf countries; such as Dubai and Al Riyad.

Hyper Identity Defined

Charles Correa (1983) defines identity as a process, and not a found object. He asserts that our search for identity could give us a much greater sensitivity not only to our environment, but to ourselves and to the society in which we live. For Correa, "the search for identity is a by-product of looking at our real problems, rather than self-consciously trying to find identity as an end in itself, without worrying about the issues we face."

For Hall (1996), "cultural identity is a matter of 'becoming' as well as of 'being' and it belongs to the future as much as to the past." According to Hall, there are two major ways of thinking about cultural identity:

> *The first position defines cultural identity in terms of one shared culture reflecting cultural heritage and cultural codes shared in common. Cultural identity is viewed as stable over time since as an inheritance it has been selected and reinforced by many generations. The second position thinks of cultural identity as framed by two axes or vectors, simultaneously operative: the vector of similarity and continuity, and the vector of difference and rupture (Hall, 1996).*

For Song (2005) cultural identity is "not a fixed and unchanged essence that transcends time and space, or a true and authentic origin, to which we can ultimately return, cultural identity undergoes constant transformation." The term *hyperidentity* is used in this paper to signify the hybrid nature of identity. According to the American Heritage Dictionary, *hyper* means "existence in more than three dimensions or linked and arranged nonsequentially." The paper considers the three dimensions of identity to be: time, place and culture; the forth dimension would be change.

The paper utilizes the method of analysis suggested by Zavalloni (1993) to understand the identity creation, formation, and transformation. This method provides a theoretical understanding of identity as a system. He uses the term *figure* to describe any unique group representation of identity. According to Zavalloni:

> *We can imagine the cultural space as an open "clipboard" to which anyone can affix a figure that describes those groups. A figure can take many forms: it could be a discourse, a text, a painting, an argument, an exemplary act or a metaphor, ranging from the trivial to the complex, from the innocent to the malevolent, which addresses a social group. Hyperidentity figures can be described as cultural elements that are embodied and energized by the brain/mind of those who create and of those*

receive them. Inside the person, so to speak, as part of the identity system, these figures are invested by desires and emotions that were produced, originally, in a different context (Zavalloni, 1993).

Architecture and the built environment constitute some of the *figures* found in a cultural space produced by individuals, groups and institutions to satisfy certain needs and requirements according to common culturally accepted and desired ideas. Zavalloni uses the term *hyperidentity* to "characterize groups as the sum of all the representations produced about them" (Zavalloni, 1993). He believes that the concept of hyperidentity frees us from thinking about groups in terms of an "essence" and allows us to view cultural identity's changing nature.

The Cultural Space in Kuwait at the Beginning of the 21st Century

The city-state of Kuwait has evolved during the second half of the 20th century under influences of economic, international and global changes. After living for hundreds of years in a traditional environment, the Kuwaitis migrated to planned neighborhoods that rapidly transformed their traditional way of living and cultural identity. The planning of new neighborhoods was influenced by models and strategies of urban planning and architecture borrowed from other cultures and introduced through master plans and design schemes. This process of cultural change has continued through the second half of the 20th century and the beginning of the 21st century, when this hybrid culture was subject to regional and international political and economic impacts under the forces of globalization. The result was, as Stross (1999) called it, a "hybrid culture derived from the mixing of cultural elements from unlike sources" and a cultural space that reflects a *hyperidentity*.

The migration of Kuwaitis from the traditional settlement to planned neighborhoods during the Fifties and Sixties was the result of economic prosperity after the discovery of oil during the Forties when oil flowed, population boomed and the city sprawled. The rapid expansion was matched by hastily made plans. The first Kuwait Master Plan of the 1950's was based loosely on standard city planning of post-war Europe. It tore down old houses and replaced them with modern buildings and structures. The city center, once a place where families lived, shopped, worked and played, was foreordained a commercial district and residents were shifted to Western-style family homes and apartments in the new neighborhoods. This period was followed by other transformations resulting from global economic and political challenges during the Eighties and Nineties. The stock market crash of the Eighties was followed by the dramatic experience of invasion and liberation during the Nineties. This rapid transformation of culture resulted in a vibrant, jumpy, and agitated identity; a hyper-identity. It also idealized the past as the only valid cultural identity and initiated the search and reinvention of a lost tradition.

The 21st century has brought new challenges to the already transforming cultural identity in Kuwait. Following 9/11 attacks on the US and its efforts to retaliate by attacking "centers of evil" around the world, Kuwait found itself in the midst of world events as the only available

US point of entry to Iraq. This brought world attention to Kuwait for the second time after its liberation from the Iraqi occupation in 1991. These events highlight the important location of the small city-state of Kuwait at the cross-roads of world events and global interests as a major producer of oil since the middle of the 20th century (Figure 1).

Following the 2003 Iraq war and the relief from security threats, Kuwait has started to develop plans to catch up with other rapidly developing Gulf countries; especially Dubai, who used to be followers to Kuwait steps during the Sixties and Seventies. The decade of the 1990's was a dark age in Kuwait under the shadows of the Iraqi hostile regime. In the 30th of March 2006, Kuwait has announced plans to build a new city on the north side of Kuwait bay area. The new city is called "The City of Silk"; or "Madinat Al-Hareer" in Arabic, and is expected to cost more than 25 Billion KD. (1 KD equals approximately $ 3.33) The Vision Statement (2006) of the new city states that:

Over the past two decades, the world has watched as the Middle East has emerged as a centre of invention and innovation. Our sister cities of Dubai, Abu Dhabi, Riyadh, Manama, Muscat, and Doha have transformed themselves from quiet trading ports and crossroads into international cities of commerce, leisure, hospitality, and an entrepreneurial splendor that is the envy of the world. From this tradition started over 20 years ago, we've seen our neighbors accelerate development at a pace unimaginable. Today, we add to this great continuum of growth in the Arabian Gulf with *Madinat Al Hareer*, the City of Silk.

As proclaimed by the vision statement, the city is "founded on the rich heritage of Arabic

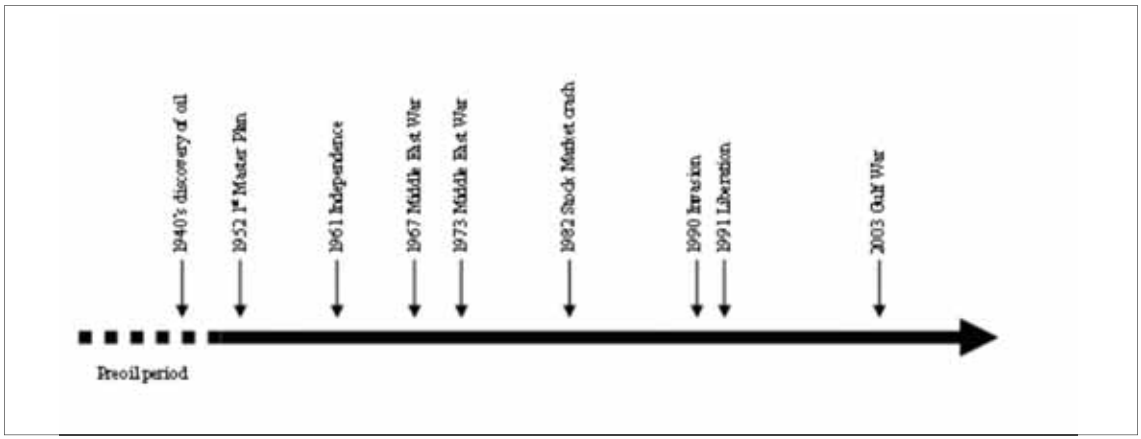

Figure 1: Major Events Since the Discovery of Oil in Kuwait.

gardens, towns, palaces, and markets. It balances Centers of Faith with Centers of Commerce as a rich garden city on the Arabian Gulf." The city is made of four new city centers; Finance City, Leisure City, Culture City, and Ecological City. "It is a new cosmopolitan city for a new century", stated the vision statement.

At the center of the city stands Burj Mubarak Al Kabir, "the Tower of a Thousand and One Nights" as a symbol that stands as an icon for the world to know. The tower is designed to exceed all known tall buildings in the world, especially the Burj Dubai that is expected to rise up to more than 800 meters in the sky. "Standing 1001 meters tall, it will house 7 vertical villages combining offices, hotels, leisure, and residential into a vertical city centre that reaches for the heavens. The design is inspired by the defiant flora of the desert as much as the rich folklore of Arabic heritage described in 'Kitab Alf Layla wa-Layla'."

This symbolic use of tradition as a source of inspiration for design in the context of a mega-projects is also found in other parts of the Gulf countries mega-projects and structures; i.e. Burj Dubai. The intention, as Marcuse (2006) put it, is "to link the construction, executed in the tradition of global power, with a local recalled tradition." It also answers the appeals of the officials and the public to "recover the lost identity" in the built environment. Many local critics of the contemporary urban environment in Kuwait are idealizing "traditional architecture" as the only "valid" Kuwaiti architecture identity. A romantic attempt to "rebuild that past" in the form of a "traditional village" is currently under construction and many buildings that utilize elements from traditional Kuwaiti architecture are found (Figure 2).

Figure 2: General Views of the City of Silk, Kuwait

As observed by Nezar Al Sayyad (2001):

Many nations are restoring to heritage preservation, the invention of tradition, and the rewriting of history as forms of self-definition. Indeed, the events of the last decade have created a dramatically altered global order that requires a new understanding of the role of tradition and heritage in the making of social space and the shaping of city form (Al Sayyad, 2001).

The same approach is utilized in the design of other projects and buildings. Another mega-project that is expected to be built within the next ten years in Kuwait is the New University City in Shidadiyah. The New University City will have three affiliated campuses, including one for female students, one for male students, and the medical campus. The campus master plan is conceived as a city on the banks of a river of landscape. Two campuses, one for men and the other for women, are separated by a wide oasis – a "Palm Forest" over one kilometer in length containing 10,000 palm trees. Faced by faculty offices and Graduate Studies Research, it will be a quiet space of academic repose, a sanctuary and place for contemplation that will become an icon for the University. Within the University City, college clusters will form neighborhoods bringing scale and identity to each part of the University. (CCA, 2005) While the new university facilities are expected to resemble any western university facilities, its identity will be influenced by cultural and social conditions and references.

On the other hand, several tall buildings are under construction in Kuwait downtown benefiting from recent changes of building regulations that permitted the increase of building height from 20 to 100 floors. Tall buildings are considered symbols of development and modernity. All these new tall buildings are constructed using advanced construction materials and technical systems, yet, many of them are using features of traditional and local architecture in order to express a local identity. As one designer put it:

The architect is required to blend modernity and tradition. Modernity in terms of technological advancements; i.e. smart buildings, and advanced building materials; i.e. curtain walls and flooring. Tradition is the need to have architecture that recognizes the environmental requirements and interacts with it. It is the recognition of local and historical aesthetic elements of the region. We should present to the world our own model in order to regain our leadership and tradition and re-write a new history (Abdel Rahim, 2006).

The Need to Express a Local Identity in Architecture

Why did the need to express a local identity by blending modernity and tradition arise? Is it a real "need" or a "selling" strategy of new real-estate? During the fifties, when Kuwait was transforming from a vernacular settlement into a modern planned city, there was no requirement to blend tradition and modernity in the planning of the new city. The ambition was to join the modern world and break all linkages with the past; including the traditional environment that was associated with poverty and primitive living conditions. Today, the identity expressed through the use of traditional style is viewed as a defense mechanism against the domination of the sweeping identity of globalization.

Several research studies were conducted by the author to understand the extent and the meaning of the phenomenon of expressing cultural identity in contemporary Kuwaiti architecture by utilizing elements from traditional Kuwaiti architecture. The first study was conducted in 2005 and focused on a group of Kuwaiti architects who attempt to express a distinctive Kuwaiti cultural identity in their projects. A sample of 18 architects were selected for the purpose of that study. In-depth interviews and standardized questionnaires were used to collect information from the architects.

The study revealed that there were several strategies employed by Kuwaiti architects to express a Kuwaiti cultural identity in their work. There were architects who express cultural identity by borrowing from traditional architecture believing that the sources of cultural identity are derived from the past, and there were architects who express a cultural identity that relates to today's prosperity and future ambitions. There was an agreement among architects that there were elements, vocabularies, proportions, and materials that distinguished traditional Kuwaiti architecture, but there was no agreement on whether they should be used again or not. Some architects thought that the reuse of these elements and vocabulary was essential to achieve a distinctive Kuwaiti architectural identity that relates contemporary architecture to traditional architecture. Others believed that it was not a necessity to use these elements and vocabularies but it is essential to respond to the climatic conditions and the specific needs of the Kuwaiti people.

There was recognition among Kuwaiti architects that buildings alone are not sufficient to convey the cultural identity. The context of architecture provided an important background against which architecture was understood. The traditional city spaces provided an important dimension to the experience and provided a meaningful reading of traditional architecture buildings. When placed against modern streets and buildings, traditional elements and vocabularies read more like Disney World than authentic architecture. The study concluded that among architects "identity was always pluralistic, fluid and unstable and that it is continuously constructed and reproduced by the collective imagination of the community" (Mahgoub, 2006).

Another more recent research study was conducted in 2006 by the author to compare the views of the architects with the views of non-architects. A random sample of 127 practicing architects in Kuwait and 186 non-architects were selected for the purpose of comparative study. A standardized questionnaire was developed and distributed to compare the differences and commonalities of the meaning and importance of expressing a cultural identity in architecture between architects and non-architects.

The results of the study indicated that there were important differences between the views of architects and non-architects regarding the meaning and importance of expressing a cultural identity in Kuwaiti architecture. There was a significant difference between architects and non-architects views regarding the expression of cultural identity in contemporary

architecture and environment. While architects considered that architecture is always an expression of contemporary culture and life style, non architects believe that cultural identity is only expressed in traditional buildings and environments. Architects considered cultural identity to be expressed mainly through the urban context while non-architects considered that cultural identity to be expressed mainly through individual buildings.

Another important difference was found between the views of the architects and the non-architects regarding the role of the client in positively contributing to the establishment of a cultural identity. While architects considered the client as an important contributor in encouraging the architect to design buildings that reflect a local cultural identity, non-architects considered the architect as the sole responsible entity for the promotion of cultural identity in architecture.

Typology of Hyper Identity in Kuwaiti Architecture

Manuel Castells (2004) has devised a typology to understand the identities of collective projects. According to Castells they are: identities of legitimization, introduced by institutions in order to extend their domination over social actors, identities of resistance, generated by actors which are constituted for cultural survival, to withstand social, religious, territorial and linguistic domination, and new identities, constituted when social actors build a new identity often based on identities of resistance but transcending them. Along with these strong collective identities, there are also individual identities founded on a personal project or elective principle, and these are particularly important in societies in which communal identities are not developed. The following is an attempt to understand the expression of cultural identity in Kuwaiti architecture by utilizing this typology.

Identities of Legitimization

State and governmental institutions are utilizing Islamic and traditional Kuwaiti architecture elements and principles in the design of their buildings. These styles provide them with the required reference and identities of legitimization. For example, the Grand Mosque is designed according to Islamic architecture principles and elements as an expression of its function as a religious building, while the Place of Justice is designed using Islamic architecture shapes and elements to reflect its reference to Islamic laws and legitimization. Also, the design of the new state palace, Al Sief Palace, reflects Islamic, Arab and traditional Kuwaiti Architecture in terms of its masses and details, i.e. windows (*mushrabiyas*), rooftop (*dirwa*), and gates (*bawaba*). The interior is a display of formal elements of Arabic and Islamic architecture and Kuwait heritage.

On the other hand, the Municipality building was designed and constructed during the late Sixties according to modern architecture principles and materials of that time. The building is composed of three identical linked glass boxes four stories high, resembling some of Le Corbusier's projects in Brasilia. The building was constructed using reinforced concrete and glass curtain wall system for the first time in Kuwait. Parents used to take

Figure 3: Identities of Legitimization: (Left) Municipality of the City of Kuwait, (Right) Parliament- Kuwait General Assembly.

their children to see the building as one of the marvels and a representation of the future anticipated by everyone in Kuwait. The identity expressed by the building was a futuristic one representing the ambitions of the country, lead by the municipality, to become a modern and developed country. The influence of the Municipality building style is apparent in many apartment buildings and private villas especially in the down town area (Figure 3).

Today the Municipality building style is described as outdated "old-fashion" style. The building became crowded with the increase of number of departments and employees required for its heavy administrative work. A new addition composed of a 10-story tower is currently under construction to host the growing need for space and services. The façade of the new addition is designed as a tall Islamic pointed arch and will be replicated in all six governorates of Kuwait. The large scale of the pointed arch is out of proportion and disfigured. As David Hansen of P+W put it, "it's like wallpaper plastered onto a high-rise." (Hansen, 2006) Other public buildings are also designed using Islamic architecture elements and principles; such as arches and courtyards. They include new buildings for ministries of Public Works and Ministry of Energy.

The Parliament Building, designed by the celebrated Danish architect Jorn Utzon during the Seventies, is an example of a building illustrating the identity of legitimization in different way. The building is not "covered" by traditional and Islamic architecture elements but it incorporates the essence of the tradition in its contemporary design. The building was designed as a grand souq covered by a large

tent. The grand souq provides a place for interaction and communication between people and government under one unifying and protecting roof. The north gate is used as an entrance for the public, the south door is used by the government and people representatives. The building was described by Vale (1992) as "an architectural essay which endeavors to assemble national identity out of sections of concrete." According to Vale, the attempt by Utzon to define and promote a national identity for Kuwait has two aspects:

First, there was a perceived need to assert a Kuwaiti identity that went beyond relatively recent matters of petroleum and riches. More precisely, this yearning was for an identity that precedes these and encompasses these in a culture with deep historical roots. And, second, closely tied to this wish to emphasize historical depth was the recognized urgency to stress and maintain the privileged claims of Kuwaiti citizens within the plural society in which they remained a minority. The initial decision to commission a prominent building to house the National Assembly and the particular forms with which this building was carried out are each manifestations of this dual search for identity (Vale, 1992).

Identities of Resistance

The second typology of identities, as suggested by Casteells (2004), is "generated by actors which are constituted for cultural survival." Architects who attempt to resist the "invasion" of the modern style are utilizing elements and principles of traditional Kuwaiti architecture in their design. A major actor in that realm is architect/developer Saleh Al Mutawa who designs his own projects and buildings. His projects include apartment buildings, hotels and restaurants that utilize elements and forms derived from traditional Kuwaiti architecture. His work is controversial because of its literal reference to traditional Kuwaiti architecture elements and shapes. According to Goodwin (1997), "his architectural language makes an immediate impact on all who see it, but it is disconcerting to fellow architects." Khattab (2001), has reviewed carefully the work of Al Mutawa and concluded that:

After reviewing some of the works of Al-Mutawa, one can define some positive and negative aspects. Among the positive aspects is that his unique style is his own architectural invention that comes principally out his personal development and cultural background, as well as from advances in modern engineering. He has also shown how he can break the conformity and the monotony inherent in most of the buildings in Kuwait through the creation of poetry of concealed disorder in his domestic buildings. Yet there are some negative aspects in his work, such as the superficial use of wooden beams, which appear to support concrete roofs and balconies, and the contradictory mixture of styles of arches and motifs used in the same building and sometimes the same facade. Despite these shortcomings, a local image of Kuwait's heritage is invariably reflected in Al-Mutawa's work. Whether this image is specifically a "Kuwaiti image," as he claims, or not is open to debate. Some architectural critiques agree with him, while others criticize his work as only pastiche and stereotyped decoration of traditional forms (Khattab, 2001).

Some of his significant projects include Salmiya Palace hotel, Al Zumuruda restaurant and several apartment buildings found in

different neighborhoods in Kuwait. He copies directly from traditional elements of Kuwaiti architecture in an effort to "revive the lost identity", as he claims (Al-Mutawa , 1994). One of the interesting observations is the reference of the residents and the public to these apartment buildings style as the "Spanish" style and not the "Kuwaiti" style. They are not understood by the public as an expression of a Kuwaiti traditional architecture, an illustration of the miscommunication between architects and people.

Another project that illustrates the same typology is Souq Al Zul Wa Al Bshut designed by the Kuwaiti architectural firm Bonyan. It is a traditional souq composed of shops selling traditional clothes and rugs located in the heart of the old downtown. It is designed to reflect traditional Kuwaiti architecture. This project was selected by many architects as a successful contemporary attempt that represents a Kuwaiti identity in architecture. The scale and location of the project in the downtown area adjacent to the traditional souq Al Mubarkiya and Souq Al Tujaar relates it successfully to the history of the area which was the heart of old Kuwait city (Figure 4).

Figure 4: Identities of Resistance: (Left) Almutawa, (Right) Souq Alzul.

New Identities

Buildings designed according to "identities of resistance" are being criticized by architects and critics as a "simplistic" approach that degrades cultural identity to a mere copy-and-paste exercise of traditional elements and principles. They argue that architecture should focus on new building functions, materials, methods of construction, technology should not be concealed by facades that are copied from the past. They are introducing "new

identities" through the design of buildings that incorporate new functions that did not exist in the past with traditional design principles and elements to satisfy contemporary cultural needs and in completely new ways.

Le Notre restaurant building is an example of a contemporary design by a Kuwaiti architect using a completely different approach. It attempts to create a new cultural identity that blends the past and the present in one single entity. The building hosts a restaurant overlooking the Gulf coast. It has many references to traditional architecture using modern materials and technology. Users do not detect easily the many references to the past that are provided by the building design and details. The past is concealed under layers of modernity and contemporary materials and technology and it has to be discovered and revealed (Figures 5 & 6).

5.

6.

Figures 5 & 6:
The Emergence of New Identities in the City of Kuwait
5. Chamber of Commerce
6. Le Notre Cafe and Restaurant.

Another important landmark is the new headquarter of the Chamber of Commerce and Industry of Kuwait that was opened in 1999. The building was designed by the international consulting firm HLW in collaboration with the local consultant Al Jazeera Consult. The building covers 5000 square meters and contains a 5-floors podium and 15-floors tower hosting 36000 square meters of office space and higher administration and services. The external cylindrical shape of the tower was inspired by the origin of the name of Kuwait; *Alkut*, meaning small fort and the traditional shape of forts found in the Gulf peninsula that old Arab tribes used for protection during outside attacks. A reflective ceiling tops the tower reflecting its lights to the rest of Kuwait. The podium of the building is covered by rough and smooth precast concrete panels producing horizontal line resembling old Islamic buildings. This reference to cultural heritage of trading was instrumental in developing the design of the building. The building is equipped with state-of-the-art furniture, HVAC, technical and communication systems.

A more recent project is Al Kut shopping center located on the waterfront of Al Fahaheel district south of Kuwait was opened in 2005. The project hosts modern shopping center amenities within a design that incorporates local and Arab style. Designed by the Jordanian architect Rasem Badran, the project is expected to boost the economy of the area especially after the addition of Al Manshar hotel and shopping complex by another Jordanian architect Wael Al Masry.

Individual Identities

Individual identities are found in villas and houses built by Kuwaiti citizens on lots of lands given by the government as part of plot and loan housing program. The owners hire architects to design their houses and villas according to their specific needs and desires. They try to lower the cost by hiring "low-budget" architects, most of them are from Arab or Asian countries who do not have any interest in expressing a cultural identity in their buildings rather than that of the owners' wishes and whims. The product is a "mixture" of architectural styles lined side by side along the narrow streets of residential neighborhoods. Some owners are influenced by what they see during their visits and travels to other countries. Others are influenced by their religious and cultural backgrounds that dictate certain requirements and needs; especially privacy requirements and separation of men and women. Other owners express their interest in expressing their Kuwaiti cultural identity by incorporating elements of traditional Kuwaiti architecture or even elements from their old houses in the new designs; i.e. old wooden doors and windows. A significant traditional element that is added to each house is the *diwaniya*, a separate room where men gather in the afternoon to discuss social, political and economic concerns (Figure 7).

Conclusion

Architecture is a story teller, and its narrative provides the basis for understanding identity (Baudrillard, 2003).

The paper utilized many projects to illustrate the typology of identities that can be found in Kuwait. They illustrate the story of development of cultural identity and the current struggle between tradition and modernity expressed

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Figure 7: Individual Identities as Expressed in Private Residences throughout the City of Kuwait.

in architecture and the built environment. Buildings constructed during different periods of the development of Kuwait illustrate the state and priorities of cultural identities at that time. For example, during the Sixties and Seventies the interest of the country was to join the modernized world utilizing the financial capabilities allowed for by the revenues of oil sales. Buildings constructed during that period; i.e. Municipality building, Airport, Kuwait Towers, Stock Market, etc., were designed according to modern and international style approaches. During the Eighties the economic crisis of the stock market reduced the financial capabilities of the country and the individuals and produced buildings with basic structural and technological necessities. The security crisis of the Nineties, due to the invasion and liberation experience that Kuwait has passed through, promoted the renewed interest in expressing a "genuine" cultural identity. The source of this genuine cultural identity was thought to be found in traditional buildings and lifestyle. Meanwhile, globalization is facilitating contact with other culture and lifestyles, through ease of travel and communication, is adding to the paradox of defining a "proper" cultural identity. As Song (2005) put it:

Globalization and migration brought and continue to bring multiple cultures into contact, the complexities of cultures render a simplistic binary theoretically problematic. There is a calling for scholars to move beyond binary forms of analysis and invent new critical paradigms that will help scholar to theorize the fluidity, multiplicity, and intricate contradictions that characterize all forms of cultural identity (Song, 2005).

The problem of architecture and buildings is that they are tangible, static and lasting more than other products of culture. They freeze moments of cultural process as products of certain time and era. Baudrillard calls it "architecture's cultural omnipresence" (Baudrillard, 2003).

While cultures change rapidly their architectural products remain unchanged expressing moments of cultural change and development. This paper concludes that cultural identity is a meaning making process that consolidates past traditions with contemporary conditions and desires. Multiple identities may coexist at the same time representing different groups in the society. Cultural identities may also shift from one state to the other adjusting to external pressures and circumstances. The paper utilized the case of Kuwait as an example of hyper-identity expressions in architecture that can be found in other Gulf countries and the world. The paper recommends that when searching for cultural identity, one should expect be find several overlapping identities. In sum, a more open-ended approach is required when studying cultural identities that stresses the *hybrid* and *hyper* nature of culture identity; a hyper-identity.

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MEDITERRANEAN VISUAL MESSAGES: THE CONUNDRUM OF IDENTITY, ISMS, AND MEANING IN CONTEMPORARY EGYPTIAN ARCHITECTURE

Ashraf M. Salama

Abstract

Egypt like many of the Mediterranean countries is an amalgam of influences. Its rich history and unique geographical position afforded many opportunities for the emergence of architectural trends and movements. This article presents a new positional interpretation of contemporary Egyptian architecture. It is culled from a spectrum of issues I have presented in several events and published in local and international conferences and trade magazines. However, it calls for a fresh look at the issue of meaning in architecture by critically analyzing the current status of architecture in Egypt through a reading of trends that emerged over the last decade. The article discusses the concepts of Mediterraneanism and Middle Easternism in association with the situation of architecture and urbanism in Egypt. A number of ISMS including postmodernism, historical revivalism, critical regionalism and confusing symbolism are identified and reviewed and representative examples are critically analyzed. The article concludes by outlining an approach for a deeper insight toward the understanding of meaning in Egyptian architecture.

Keywords

Identity, ISMS, meaning, Mediterraneanism, Middle Easternism, contemporary architecture, Egypt.

The Two Way Mirror!

Societies tend to re-evaluate the meaning and desirability of built environments rapidly. The search for an architectural identity, the rise and fall of ISMS (movements and tendencies), and the continuous debate on symbolism and character issues in architecture are derived from this fact. That search seems to be a preoccupation with countries that have cultural richness and multi-layers of history. Architects and designers in those countries find themselves dealing with a paradox needing to project a certain image of themselves through their built environment. In the Mediterranean region, issues that pertain to identity, character, and architectural trends of the built environment have been in debate for several decades, more so because of this region's cultural uniqueness and plurality. However, it is this cultural uniqueness that has made it a tough quest and has – in many cases— culminated into sacred symbolism that is painful

to behold or comprehend. Some scholars pose the question of the necessity to refer to cultural or religious symbolism in architecture to reflect a specific identity. Others argue for the fact that Mediterranean architecture should embody the collective aspirations of societies in this region. There are many who have questioned the need to debate architectural identity at all, claiming that it merely displays a lack of "self-confidence" as a region or as a group of nations. Reviewing the recent practices and searching the recent debates reveal that we still seem to be at odds with the issue of identity. Also, the review corroborates the absence of serious discussions and research on meaning in architecture. On the other hand, images and image making processes do not often address the issue of meaning in relation to the public. This mandates looking at the built environment as a two-way mirror. One way can be seen in the sense that it conveys and transmits non-verbal messages that reflect inner life, activities, and social conceptions of those who live and use the environment. The other way is seen in terms of how it is actually perceived and comprehended by a certain society at a certain time; simply how it evokes certain image for that society.

Egypt Between Mediterraneanism and Middle Easternism

The Mediterranean and a conscious of it existed long before the 19th century; no one would deny that there is such a thing as a Mediterranean cultural unity woven through centuries of trade and cultural exchange (Fuller, 1990). However, in the world of cultural politics it would appear that "Mediterraneanism" took a back seat in recent debates where other competing forces such European Union, Arab League, MENA, and Middle Easternism have emerged.

In the context of European debates on the Mediterranean, two attitudes can be identified: the first looks at the Mediterranean as a bridge in terms of history and culture while the second focuses on it as a line of division or barrier. The first refuses Huntington's thesis of the "Clash of Civilizations" (Huntington, 1998), while the second reflects the old North-South conflict as expressed in a growing fortress mentality that has only one interest; closing the frontiers against the culture of the south (North Africa) for merely political purposes. In this context one can find that several socio-political arguments have voiced the opinion that an attempt to re-build Euro-Arab partnerships is critically needed (Omaya Abelatif, 1996; Sid Ahmed, 2000).

Mediterraneanism and Middle Easternism have been described as "partnership" and "conflectual" models. However, they have several features in common. Both include polar partners and in the context of globalization none of the partners can ignore others where the main characteristic is the downfall of barriers between regions and societies. However, some voices are now arguing that globalization paradigm is paused since local problems--exemplified by economic hardship and poverty, and political instability-- were much more stronger in influence than the idea of a global world and thus its potential was never realized. Cultural politics in recent years have had tremendous impacts on economy, development, architecture, and urbanism. Whether Mediterraneanism or Middle Easternism several countries in the region are witnessing common features and discourses

on architectural practice and academic scholarship.

The cultural, political, and economic movements in the Mediterranean have heavily influenced Egypt. Over three decades of fluctuating cultural politics in the region the Egyptian economy has passed through three distinct, but related, phases. These were the open door policy, the economic reform, and privatization. The open door policy took place during the period between 1974 and 1981. It placed emphasis on encouraging the private sector, at both regional and international levels; to develop and employ new investment plans. Laws pertaining to taxes and trade have been tailored to facilitate foreign investments and international trade. The economic reform was the second phase that occupied the whole decade of the Eighties. The main objective of this phase was to heavily involve the private sector and to encourage international investment in several development realms. Therefore, the government has designated 50% of its total investments to facilitate the efforts carried out by these segments. Laws were tailored to encourage local investment in desert development, land reclamation, industrial development, housing and urban development, and tourism. The preceding two phases culminated into the privatization era, which started in 1991, emphasizing the effective interaction with market dynamics. The repercussions of these phases on the urbanization process are evident, especially when looking at the private sector investment in intensive housing and industrial development around greater Cairo (Salama, 1999).

The government has failed to fulfill a number of roles pertaining to public service delivery and guiding the privatization process and this resulted in the monopoly of the private sector to deliver these services, succumbing its operation to market speculation. The active and aggressive participation of the private sector in housing and service delivery led to a virtual inflation and an overrated and overestimated real estate development. Evidently, the private sector targets strategic locations inside the urban perimeter of central cities for developing large-scale luxury commercial and office buildings. It also directs its housing projects of the new cities to the affluent population and the upper middle class avoiding the larger segment of society.

Although Mediterraneanism and Middle Easternism are constructs that serve political ends they are of heuristic value. They bring into focus questions about identity and the sharing of deeper meanings at cultural and human existence levels. The unique political, cultural, and geographical position of Egypt in the Mediterranean and the Middle East created a rich soil for architectural and urban development experimentation where a number of ISMS have emerged toward originating identity and in search for meaning.

Egyptian Post Modernism and the Emergence of Historical Revivalism

Internationally, post-modern movement was a direct challenge to many of the premises upon which modern architecture was predicated. It acknowledged the role of symbolism in architecture and regarded modernism lacking the premises to properly respond to the

emotional and cultural needs of people while simultaneously expressing economic, scientific, and technological givens of the time (Mitchell, 1993). Post modernists acknowledged the taste codes of the public as a source of design, in the belief that such a practice will help their work communicate with the public.

On criticizing the attitudes of post modernists, Nikos Salingaros argues and rightly so, that *"The "star" system of design makes a building the achievement of a single individual based on his/her personal preference or whim. The public might still seem to admire such a building, but only because some "expert" declares it to be a great work of architecture. This manufactured admiration does not arise internally. Personal whims and stylized expressions serve only to distance the user from the architecture, because they negate the greater spectrum of neurological connections"* (Sanlingaros, 2004) While this understanding is unquestionable, one should note that whether academics, theorists, and responsive practitioners agree or do not agree with current practices, such attitudes are still phenomenal and are a result of current economic, socio-political visions. On that basis they need to be investigated.

In Egypt, postmodern movement is formed within the framework of the international post- modernism. It does not offer a critical vision of previous local architectural thoughts (modernism). It is a simple transposition from following the international modernism to following the international post-modernism (Salama, 1999). The major weakness lies in the fact that its disposition does not allow it to go far enough in its acknowledgment and understanding of its context. It does not address the shortcomings implicit in modernist architectural practices, but rather, it tacitly accepts them.

Historical revivalism is not new as an architectural trend; it existed since the European renaissance. However, it has re-emerged everywhere in the Mediterranean including Egypt as one of the important ISMS underlying post modernism, which have influenced the architectural scene. Several Egyptian architects envisaged the selection of many historic features specifically plowing from the Egyptian history that has a rich mix of three main cultures, the Pharonic, the Coptic, and the Islamic. They believed that simulating the history in contemporary buildings would help establish a sense of belonging and a strong emotional tie between society and the built environment (Salama, 2002-a).

Within the Egyptian context, one can see two ISMS that represent the revivalism trend; the first is a scholarly copying from the past which can be labeled as "cloning" or copying-pasting" or attempts at re-interpretation. However, in the process of re-interpretation of images many architects produce images that are grotesque and clownish! In this respect, one can argue that also eclecticism, the license to select, borrow, and copy from the past became integral component of architectural practice and education. Concomitantly, to copy from the past became, unfortunately, logically acceptable. Examples of historical revivalism are evident in the works of El Gohary, Abo Seif, and others. In this respect, one can argue that also eclecticism, the license to select, borrow, and copy from the past was revived. Concomitantly, to copy from the past became,

unfortunately, logically acceptable. Examples of historical revivalism are evident in the works of El Gohary, Abo Seif, and others.

In the headquarters of Oriental Weavers, Farouk Al Gohary uses hierarchical arches and designs the building with an inner courtyard. Openings are covered with stucco screens (Figure 1). It is believed that this has been to simulate the past with a contemporary image, while building corners simulate the the squinches or the muqarnas. Also, apartment buildings that have been built in the nineties deserve special attention, where features of Islamic architecture are borrowed to localize the public face of architecture. An example of this trend can be found in the works of Ashraf Salah Abo Seif who avoids the use of any modern visual features and heavily uses shallow arches and wooden pergolas and harmonizes the overall building shell in an attempt to simulate and adapt Islamic heritage (Figure 2).

Some other architects went to the extreme and allowed themselves to copy and paste from the past. In Khan Al Azizia project, the developer and the architect wanted to create, in the desert, an image similar to that of old Cairo (Salama, 1999). The architect copied some features of old Cairo such as the mashrabya and the narrow openings. An attempt was made to add and create a hybrid in some other features. However, the overall appearance is not convincing (Figure 3).

Figure 2: Apartment Building, Al Mokattam District, Cairo.
Example of Islamic Revivalism by Ashraf Salah Abo Sief.

Figure 1: Oriental Weavers Headquarters, Heliopolis, Cairo.
Example of Islamic Revivalism by Farouk Al Gohary

Figure 3: Khan Al Azizia, Cairo-Alexandria Desert Road.
Example of Cloning Islamic Architecture!.

Facadism... Surface Treatment Architecture

Another trend that can be identified based on current practices is "Surface Treatment" which is basically based on avoiding the use of any reference whether historic or contemporary, local or western. This trend can be named basic design exercises in building facades. In this respect, one can argue that this attitude is based only on the creative impulses and intrinsic feelings of the architect without giving any attention to the extrinsic influences exemplified by historic, cultural, and environmental concerns. This is due to the belief among clients and architects that buildings with distinctive visual appearance can attract public attention (Figures 4 & 5).

Figure 4: The Headquarters of the Ministry of Finance and Tax Department. *Example of Surface Treatment Architecture "A Basic Design Exercise on Building Form and Facades," By Farouk Al Gohary. Photo: Arab Contractors*

Figure 5: Integrated Care Society, Heliopolis, Cairo. *Example of Surface Treatment Architecture "A Basic Design Exercise on Building Form and Facades," By Magd Masara.*

Confusing Symbolism: The Conundrum of Identity and Meaning in Tourism Architecture

Buildings tell us about themselves almost as if they are speaking. They tell us about what is happening and what ought to happen in them. They can symbolically represent an attitude about what is taking place inside. Building entrances are no exception; they have certain qualities that can evoke a strong image in any observer; they can be inviting or repelling. We often feel emotionally triggered by an entrance image. Our first impression is to either like it or dislike it, but if we look more carefully for the reasons for our preferences we may find associations between our present feelings and past experiences (Sanoff, 1991; Salama, 1996 &1998). Entrances can have different meanings that depend on our ways of looking at objects. The meaning of an entrance goes beyond the fact that every opening in the

ground floor level that goes down to the floor is immediately understood as an entrance. In some cases we can easily identify who uses the building and what happens inside it by looking at its entrance. This always occurs when some physical aspects of the entrance fit the idea we have about certain people who inhabit the building and what they do there (Sanoff, 1991, Salama 2001-b).

During the last fifteen years there has been a surge in the construction of tourist facilities along the Northern Coast, the Red Sea, and Sinai peninsula. These facilties are shaping the skyline and waterfront of these areas, and examining the charactersitics of their entrances is thus paramount When looking at the entrances and gates of tourist facilities of Hurghada one can explore some answers to these questions: Should the entrance of a tourist facility convey the message that it is a special place for tourists? Should it be welcoming for both tourists and locals? Should its size and scale reflect the number of the occupants? Should it reflect our heritage, toursits heritage, or current technological advancements? These and other related questions form the basis for understanding the meaning of entrances of tourist villages. Eighteen entrances (Figure 6) have been photographed and examined in an attempt to investigate some aspects that pertain to visual pleasure and meaning (Salama 2001-b).

Entrances have the capacity to unleash feelings, trigger emotional reactions, feed the memory, and stimulate the imagination of the public. Thus, the image of the entrance allows the public and the visitors to anticipate the interior world. The character of the entrances in the facilties examined reflects the overall tone/ character of the project. However, on the one hand, one can find some confusing images where the image of the entrance or the gate differ from that of other masses of the project as in the case of Marlin Inn and Alaadin Beach Resort, an aspect that produces ambiguity and is usually misleading to the public. On the other hand, one notices in Intercontinental Hotel a better treatment is made, where the design of the outside gate matches the entrance of the main building that is in harmony with the rest of the project, as well as the interior environment. While the aesthetic qualities of entrances are to be respected, for a complete appreciation one must go beyond the visual appearance and examine meaning and content. The inherent meaning of entrances can stand for the representation of place and/ or the representation of the people occupying it. However, entrances of tourist villages have more than that to offer. They have physical variables that carry symbolic meanings that can impart information and enhance legibility in a sense that is not confusing, easy to read, and allows visitors to know their whereabouts.

The conundrum of identity and meaning is apparent in the entrances examined. It is the cultural uniqueness that has made it a tough quest and in fact culminated into sacred symbolism that is painful to behold or comprehend. In the entrances examined one can find plurality of trends in their designs within the efforts of their designers to metaphorically reflect certain images or symbols. On the one hand, some of them simulate the Egyptian culture by reinterpreting the elements of heritage architecture, Pharonic, Arabic, and Islamic, as in the case of Sultan Beach, Hilton

Hotel and Grand Hotel, in order to attract tourists. On other hand, others simulate classical architecture or introduce images that pertain to the surrounding natural environment like Samaka Beach Resort. One can argue here that the designers of these entrances try to use metaphors, identifying relationships between the present and the past, or between the natural and the man-made worlds. These relationships are abstract in nature rather than literal. However, this does not mean that all of them have been successful in addressing the issue of meaning, but at least they are offering attempts toward introducing specific visual content for the purpose of tourism.

An important question can posed here: Does Identity Give Meaning?. To answer one must go to the deep definition of identity, it is the collective aspect of the set of characteristics by which a building, or a protion of a building is definitively recognizable (Salama 2002-b). When tracing other attributes that incorporate meaning into visual pleasure one can find that three aspects are achieved, they are according to Abel-Salam (2001): permanence, distinction, and recognition, contributing to the identity of the entrance. The aspect of permanence is observed in Mashrabiya Hotel, Hilton, Sultan Beach, Hor Plalace, and Intercontinental, where some symbolic physical elements are used such as the mashrabiya, the dome, and the sloped walls in an attempt to link the present to the past. The is exemplified by interpreting these elements in a contemporary image. Aspects of distinction and recognition are manifested in some entrances by the use of rough and hard surfaces as in the case of Giftun Hotel and Yasmine Village, or by the use of the Arch in different forms, though sometimes confusing. Although the use of white color is preferred to many, one can find it repelling in this sunny environment of Hurghada, since it produces glare with the rest of the project as in the case of Hotel Sofitel, Grand Hotel, and Beach Al Batros.

While these preliminary observations are important, one should assert that a systematic investigation and a comparative research are needed to investigate how different entrances can provide visual pleasure and meanings to different age groups of tourists, different tourist groups from different cultures, and equally important their meaning to the public and the locals.

By and large, one can recommend in this context that designers should strive to investigate the meaning of the visual content they introduce. Meaning in this respect can be interpreted with regard to perceptual, cognitive, and responsive meanings that pertain to the public and the users. Designers need to expand their skills beyond manipulating forms and develop a deeper understanding of architectural symbolism that is regarded as visual (non-verbal) mechanism they can use to communicate environmental messages to the tourists and the public about their buildings. Only when they do so, buildings will provide valuable visual pleasure, and will encompass significant meaning and relevant visual content.

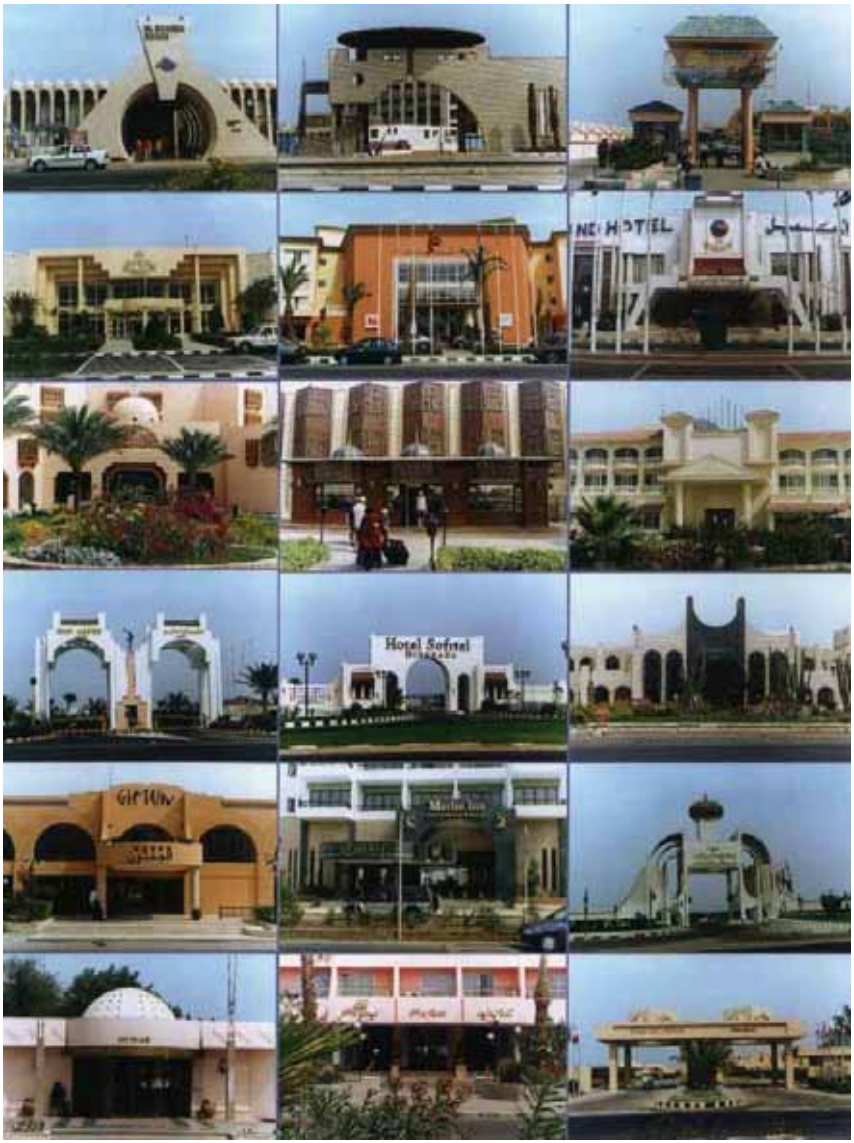

Figure 6: Example of "Confusing Symbolism and the Chaotic Search for Identity. 18 Entrances in Hurghada representing different confusing attempts to use metaphors or refer to "SOMETHING".

Content Inflecting Context and the Emergence of Gated Communities

"Before I build a wall I would ask to know what was I walling in or walling out, and to whom I was like to give offense." Robert Frost.

The phenomenon of gated communities has emerged in England in the 19th century in Britain, and later in the twenties and thirties in New England signaling the tension between the individual and society (Richardson et al. 1995) and now they are shaping most of American suburbia. It is striking to see their presence in Egypt and around Cairo. One would want to ask if they have emerged in response to a true immediate need or as a result of aggregated problems, or whether they have emerged as only one of the new ISMS.

It would appear that the failure of the new developments to attract larger number of populations to move from Cairo and settle in cities like 10th of Ramadan and 6th of October led to the dissatisfaction of affluent and upper middle class families. The private sector involvement in land development and speculation and the people search for a descent life style led concomitantly to the emergence of gated communities that can be defined as enclaves of residential units—for housing and tourism purposes-- surrounded by walls, often with security guards. Gated communities are becoming popular along Cairo-Alexandria and Cairo-Ismailia desert highways, and intensive development of gated communities is currently undertaken in "New Cairo" along the belt road, northwestern coast, and Hurghada. Many families are now choosing to reside in gated communities while others purchased residential units as a second home for weekly or monthly recreation (Figures 7, 8, and 9).

In essence—if seen as a reaction to need, gated communities are delivering what they

Figure 7: A Typical Example of a Clubhouse within a Gated Community on the Northern and Eastern Suburbs of Cairo.

Figure 8: A Typical Example of an Entrance of a Gated Community on the Northern and Eastern Suburbs of Cairo,

have promised by providing an effective defense against daily intrusions and offering opportunities for a better lifestyle. However, it can be argued that the benefits of gated communities are achieved at the expense of social issues. According to Lang and Danielsen (1997), a sense of community within gated communities comes at the expense of the identity of the larger community outside. It is anticipated that they will have strong impacts on the way in which Egyptian cities are shaped and developed.

In the thirties, the poet Frost wrote "*Before I build a wall I would ask to know what was I walling in o walling out, and to whom I was like to give offense.*" Walls, fences and gates are meant to give offense in a way or another. A Number of studies have criticized gated communities as a paradigm for architectural and urban development (Garreau, 1991; Blakely and Snyder, 1997; Lang and Danielsen, 1997; Stark, 1998) voicing the opinion that tensions and paradoxes are the result. Blakely and Snyder (1997) argue, "*Gates and fences around residential neighborhoods represent more than simple physical barriers. Gated communities manifest a number of tensions: between exclusionary aspirations rooted in fear and protection of privilege and the values of civic responsibility; between the trend toward privatization of public services and the ideals of the public good and general welfare… Blakely and Snyder (1997).*" Other paradoxes can be envisaged such as integration within the gated communities and segregation from the larger community and that engagement at the gated community level reduces the need for civic engagement outside. It remains to be seen what impact gated communities in Egypt would have on the structure of the Egyptian society and on the structure and content of the cities when more and more families and groups of individuals collectively wall themselves off from society in private developments.

Figure 9: A Typical Example of an Entrance of a Gated Community on the Northern and Eastern Suburbs of Cairo, *Manifesting the Tension between Exclusionary Aspirations Rooted in Fear and Protection of Privilege and the Values of Civic Responsibility.*

Context Inflecting Content: ISMS of Hope

Despite the presence of several negative attitudes on creating building images, one can argue that there are some signs of hopes. While such signs are not matured yet, one can argue that they can form ISMS of hopes if they are adopted by local architects.

Critical Regionalism

Critical regionalism was coined by Kenneth Frampton in 1983 and heavily discussed by Tzonis & LeFaiver (1995, 2001, 2003). Broadly defined, critical regionalism is an attempt to synthesize the rooted aspects of a region, including physical and cultural characteristics, with appropriate contemporary technology. It is the search for a contextual architecture; a content that is meaningful within its context and at the same time participates in the more universal aspects of a contemporary society. Critical Regionalism is another position that attempts to read the history of Egypt and extract its essence while adapting it to suit the spirit of the times. It can be regarded as a way to manifest cultural, economic and political independence.

When the formal vocabulary is closely related with indigenous space concept and space characteristics, one can find supreme examples that give people an opportunity to reconstruct missing links in their traditional culture and to enhance their learning process of it. In the Nile Art Gallery, Halim Ibrahim considers heritage in a building that serves a modern function. His concern was to link the current art movement in Egypt with an Islamic and Arabic cultural heritage. The project is a thoughtful attempt towards the development of a contemporary Cairene cultural identity. Gamal Bakry's work is based on profound interpretations of history and culture. In his design for the commercial and tourist centre near the Pyramids, he reflected on the cultural richness of Egypt, with a yellowish facade that references the desert environment nearby. Hierarchical masses are used to simulate the idea of a pyramid. Openings are designed with motifs that reflect Egyptian culture and a conscious attempt is made to link the building with the pyramid platform, using it as a panoramic view (Salama, 2002-a) (Figures 10 A & B).

A.

B.

Figure 10: A. Nile Art Gallery, Opera Grounds, Cairo,
Figure 10: B. Kenouz Commercial and Tourist Center, Giza
The Two Projects Involve Re-Interpretation of Local Heritage while Adapting to the Physical Context, Photo: Courtesy of Gamal Bakry.

Culturally and Environmentally Responsive Architecture

Movements toward a more culturally and environmentally responsive architecture are now taking place. Public participation, adaptive reuse and urban intervention in historic Cairo are relatively new approaches to architectural practice. The *Al Darb Al Asfar* alley project exemplifies a real experiment in limited restoration coupled with wider conservation (Figures 11 A & B).

Like other areas of heritage and cultural value, the area around the Al Suhaymi house in Old Cairo was neglected. Documentation and preservation processes started in 1994, funded by a grant from the Arab Association for Social Development. Three distinguished houses in the alley have been refurbished: the *Al Suhaymi* house (1648), the *Mostafa Gaafar* house (1713) and the *Al Khorazati* house, a living example of 19th-century residential architecture. As restoration proceeded in the three houses, the

A.

Figure 11-A: The Back Yard of Al Suhaymi House After Restoration.

B.

Figure 11-B. The Entrance of Al Darb Al Asfar After Restoration.

surroundings were also improved. Community participation was conceived as a collaborative design process; thereby increasing the sense of belonging and community appreciation of the heritage buildings they live with and in (Salama, 2001-a). *Al Azhar Park* is another project --completed in officially inaugurated in 2005-- that illustrates the practice of culturally responsive architecture. It was envisioned by H.H. the Aga Khan in the 1980s as part of a larger programme for the development and upgrading of the *Al Darb Al Ahmar* area of Old Cairo. Under the direction and management of the AKTC (Aga Khan Trust for Culture), Sites International was selected as a local consultancy to develop the final designs of the park. This project is another thoughtful attempt towards improving the quality of the built environment and retrieving some of what Cairo has lost over the years (Salama, 2002-a) (Figures 12 A & B).

A.
Figure 12: Upgraded Houses around Al Azhar Park Project. *Photo: Ragaei S. Abdelfattah.*

B.
Figure 12: Al Azhar Park; A new Lung for Cairo's Urban Core

A Responsive Argument: Towards a Deeper Understanding of Meaning in Mediterranean Architecture

Contemporary Egypt does not appear to have produced a solid architectural trend or planning direction, but rather a collection of planning and architectural positions. While few correspond to the history and economy of Egypt many defy the culture of the region. Many Egyptian architects have immersed themselves in exploring a number of trends in search of visual images that distinguish their work and that simulate the culture and history of the country in search for a contemporary identity. However, many fell into the trap of dealing with architecture in visual, formal, and pure functional terms and only in those terms. The search for visual vocabulary is a valid quest that should not be envisaged by over simplifying the meanings that this vocabulary conveys to the public. The lack of serious studies on meaning in architecture and the overall development process together with the absence of professional discourse, evaluation, criticism and assessment studies created sufficient opportunities for experimentation and concomitantly led to the continuous emergence of erratic trends and ISMS at the expense of the morphology of most cities. In response, a theoretical approach is proposed toward a deeper understanding of meaning in architecture. That approach concerns itself with two philosophical perspectives for understanding the built environment: positivism and anti-positivism.

Derived from positivism and anti positivism there are two positions: ontology and epistemology, The AHD (1994) defines ontology as the branch of metaphysics with the nature of being. It is the nature of the reality of the phenomenon that examines the relationship between the mind and matter. Epistemology is defined as the branch of philosophy that investigates the nature of knowledge, its foundation, extent and validity. It examines the way in which knowledge about a phenomenon can be acquired and conveyed. Relating to ontology, positivism adopts the position of realism involving the conception that objects of sense perception exist independent of the observer's mind and this means that reality is believed to objectives and available for observation by everyone. Relating to epistemology positivism considers knowledge as independent of the observer and objectively verifiable.

Alternatively, anti-positivism involves the conception that universal laws do not exist independent of the human mind and this means that reality is perceived by people as individuals and in groups. It adopts the view that individuals acquire different types of knowledge. In this respect, one can assert the individuals and group differences are regarded as valid and important mechanisms and thus socio-cultural context are envisioned as critical and unavoidable.

In positivism, a building is seen by architects as an objective realty with components and parts that everyone can observe, perceive, and agree upon. In turn, emphasis is placed on the common properties of architecture and its universal principles leading to the suppression of multiple viewpoints, thoughts, and voices. In anti positivism, a building is seen by architects as having multiple realties. In turn, emphasis is placed upon values, preferences, and cultural

aspirations of people as individuals and in groups leading to the production of culturally and socially responsive non-verbal messages.

In light of the preceding philosophical perspectives and positions, it is necessary to examine a number of crucial issues that posed themselves on the map of current discourses but always avoided or forgotten when they come into practice. The issues are not discussed in a traditional sense that views them individually but rather centred on identity discourse that establishes links between the way in which visual and environmental messages are perceived and acquired by the public.

In philosophical terms identity appears to have three underlying definitions. These are: A) the permanence over time of a subject unaffected by environmental changes bellow a certain threshold level, B) the notion of unity, which establishes the limits of a subject and enables us to distinguish it from the others, and C) a relation between two elements, which enables us to recognize them as identical. It is critical to link designing built environments to identity in philosophical terms. Architecture is meant to be a "man-made spatial entity" in a "structuralist" sense. According to Jan Piaget, there are three main points of relevance that can be introduced here, these are: "Wholeness," "Self Transformation," and "Self Regulation." A human being, as a structural entity, has the ability to modify his/her physical environment "accommodation, in Piaget's terms," as well as his well being "assimilation" in order to be able to adapt "balancing accommodation and assimilation." With these concepts in mind architectural design can be regarded as an act of preference that induces the public and building users in one way or another to reach a condition of adaptation.

If a certain environment possesses a unique character, then we may safely say it has an identity. An environment may be unique due to the use of certain unique forms that are to be found in this environment and nowhere else, or it may be unique due to certain activity or a certain sequence of human activities that were performed in this environment and nowhere else. Hence, it can be argued that there are two types of identity: visual identity, and activity-based identity. However both should—at least-- be conceptually linked.

Identity is governed by the visual field and its visual cues. Perceiving and interpreting the visual environment is a complex process involving the interaction of human physiology, development, experience, and cultural sets and values with outside stimuli. In making sense of the visual world people rely on a number of physical characteristics, which define objects and their relationships in three-dimensional settings. In 1961, William Ittelson, a leading environmental psychologist identified three basic components of the perceptual process. These are 1) definition of "Thereness" and "Thatness" as impingement by the physical object, 2) excitation of the physiological sensors, and 3) assumption in the psychological realm. According to this view, I would argue that in simple discrimination of elements in the visual field we rely on the interaction of physical qualities or cues such as size, shape, color, brightness, position in the fields...etc. At a more mature complex psychological level we interpret selected characteristics of the perceived built environment in terms of

associations and values that communicate identity and status, while establishing a context and defining a situation (Sanoff, 1991).

The non-verbal messages transmitted by the built environment convey cues which people are able to read and understand. The built environment, then, has a certain meaning, which is communicated and acted upon by people in diverse settings. This means that the built environment contains social, cultural, and symbolic information eliciting appropriate behavior. Sherif & Sherif (1963) have distinguished various characteristics of a space or an environment by classifying the visual world into fixed features (components of the built environment: walls, doors, windows, entrances), semi-fixed features (furniture and furnishings), and non-fixed elements such as people, their facial expressions, gestures, and their proxemic relationships. Therefore, it should be emphasized here that the built environment in itself through meanings attached to it affects people's perception of identity and environmental and visual qualities.

Research indicates that 87% of people's perceptions are derived through the sense of sight. However, if we scratch the surfaces of images the word "image" may reveal a sense of integrity and true identity. A positive image of the built environment goes beyond appearance to include a complete fit in the landscape and the global environment. The concepts of Image-ability and legibility introduced by Lynch in the sixties appear to enhance this finding; if an environment has the ability to stamp an impression in the mind of people, then they will carry that impression for a long period, or for the rest of their lives. It is argued that built environments have certain qualities that give them a high probability of evoking a strong image in any given observer. Physical qualities of the built environment enable the making of identified mental images. Mental images are the result of a two way process. First, people look for non-verbal cues in the built environment, then these cues transmit certain concepts, they have something to say about the people who occupy, own these environments, and about what is taking place in them.

To conclude, I would assert that current ISMS and trends are predicated on the premises of positivistic perspectives where architecture is created to establish dialogue with the self and with fellow professionals, but not with the public. A balance of the architects' preferences and those of the public is needed. Concomitantly, future debate on current architectural trends needs to concern itself with the memory of architects and memory of others, the perception of the professional community and that of others, the consciousness of architects and that of others, and the reasoning of architects and that of others. A deeper understanding of how environmental messages and cues are transmitted to and perceived by the public and how the public establishes associations between these messages and their underlying meanings and in accord with their socio-cultural backgrounds is clearly on the rise. The non-verbal messages conveyed by the work of architects would be irrelevant and meaningless if the perception and consciousness of the public; the people for whom we are producing built environments are avoided, misinterpreted, or not comprehended.

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THE NOTION OF HIERARCHY: THE 'PARCHIN KARI' PROGRAMME AT THE TAJ MAHAL

Thalia Kennedy

Abstract

This paper explores the notion of hierarchy in architectural design and decoration with specific reference to the Taj Mahal complex in Agra, dating to 1632 onwards. As one of the acknowledged architectural masterpieces of the world, addressing the concepts that lie behind the design of the Taj Mahal allows an understanding of that achievement beyond its immediate visual impact. Much research has been carried out on various aspects of this Mughal tomb complex and it is not the intention of this paper to reproduce material that is expertly covered elsewhere. The paper instead focuses on the notion of hierarchy that informs the design of the inlaid decorative programme in the zone immediately surrounding the tombs of the deceased. This zone of decoration was particularly highlighted by Mughal commentators for its opulence and accomplished craftsmanship and remains today a highlight for visitors to the mausoleum. The paper addresses three main issues: the decorative technique and its context and symbolism; a description of the gemstone and ornamental stone programme with a focus on motif, material and location; and the relationship between that programme and the concept of hierarchical organisation in its enhancement of the visual and spatial effects.

Keywords

Hierarchy; Taj Mahal; Mughal; architecture

Introduction

Hierarchical organisation is often employed in architecture to emphasise particular spaces and forms. The architecture of the Islamic world is no exception (Hillenbrand, 1984:138 and 1994:14-15). More particularly, the notion of hierarchy was employed in the sphere of Mughal architectural design in South Asia. Ebba Koch discusses the importance of hierarchy at the Taj Mahal (begun 1632) at Agra in her recent monograph and paper on the tomb (Koch, 2005:137-147 and 2006:91; see also sections relating to the central mausoleum in Cox & Kennedy, 2000). The tomb was constructed to house the body of the Mughal emperor Shah Jahan's favoured queen, Mumtaz Mahal, following her death in 1631 (Begley & Desai, 1989:xix). Shah Jahan was himself later buried next to her (Begley & Desai, 1989:141-160). In discussing the architecture of the tomb, Ebba Koch highlights hierarchy as the most dominant of one of a number of theoretical principles that informed the design

and appearance of the complex (Koch, 2006: 91). More specifically, the carved marble dados on the surfaces of the mausoleum are described as a "progressive elaboration of plant forms towards the interior" (Koch, 2006:159). It is the intention of this paper first to discuss in detail a similar idea of progression and hierarchy in the inlaid decorative programme at the Taj Mahal; and second to establish what combination of devices are employed to create this sense of hierarchy in the inlaid programme, a feature for which the mausoleum is famed.

Parchin kari (lit. 'inlay-' or 'driven-in' work) (Begley & Desai, 1991:79 and Koch, 2005:145) is a technique in which gemstones or ornamental stones are inlaid into sockets carved out of a parent stone to form a pattern or motif (see Andrews, 1995:267-270 for further discussion). It corresponds to the Italian decorative method of *commesso di pietre dure* (lit. 'composition of hard stones') and was influenced by the presence of Italian craftsmen at the Mughal court (Koch, 2006:91).

Gemstones are defined as minerals that are rare, beautiful, hard and capable of being cut or polished (Rutland, 1974:8). Their hardness is measured according to Mohs' scale of hardness, which gives them a ranking of between one and ten, with diamonds receiving the highest evaluation (Russell, 2001:4). The visual beauty of gemstones is often linked to their transparent or translucent qualities. Hard stones that are attractive and rare but lack the transparency normally associated with gemstones are on occasion referred to as 'ornamental stones' and include stones such as jade (Rutland, 1974: 8). In Mughal India, *parchin kari* was perfected by craftsmen specifically trained to execute this technique, known as *parachinkar*s (Koch, 2006:91).

At the time of construction, the less white adhesive that could be identified between each of the stones, the better the quality of workmanship was considered to be (Koch, 2006: 92). From observation of the inlaid decoration at the Taj Mahal complex, it becomes clear that the technical craftsmanship of the highest quality, as well as the most costly materials, is reserved for the area immediately surrounding the cenotaphs, for the gaps between stones are almost invisible (Begley & Desai, 1989:84).

The cost of such an attractive form of decoration was high, unsurprising given the nature of the materials used. Peter Mundy, an English traveller to the Mughal court in 1632, wrote of the project: "The buildinge is begun and goes on with excessive labour and cost, prosecuted with extraordinary diligence, Gold and silver esteemed common Mettall, and Marble but as ordinarie stones" (Alexander, 1987:191). However, although the use of the chosen stones is by no means frugal, the use of the most costly of gemstones – emeralds, rubies, diamonds and so on – was avoided, again containing the cost of the project to some degree. A useful comparison is provided by an observation by Tavernier. He recounts that, when adapting the Fort at Agra to his own purposes, Shah Jahan had wished to cover a gallery "with a trellis of rubies and emeralds which would represent, after nature, grapes green and commencing to become red; but this design, which made a great noise throughout the world, required more wealth than he had been able to furnish, and remains unfinished" (Tavernier, 1925:89). Perhaps the

decision to exclude the most valuable stones the Taj – early on in the project Shah Jahan decided against surrounding the tomb with a gold rail encrusted with gems for reasons of what Lahori describes as 'precaution' (Begley and Desai, 1989:73) – shows that the emperor was contained to some degree by financial considerations in his choice of architectural decoration.

Gemstones and ornamental stones dominate the central *parchin kari* programme of the interior marble surfaces of the Taj Mahal mausoleum and it is these areas that will form the focus of discussion here. Coloured marbles are inlaid into white marble and red sandstone exterior surfaces of the mausoleum, mosque, *jawab* and south gateway, highlighting the importance of these buildings over others in the complex (Koch, 2006:126-131,181-193). However, although coloured marbles bring a similar range of colour to the inlaid programme, they are not rare or translucent in appearance, as are the stones that appear on the interior surfaces of the mausoleum itself. The focused use of *parchin kari* fits well with the hierarchical emphasis employed throughout the architectural and decorative programme at the Taj Mahal complex (Koch, 2006:104-109). It is in keeping with the broader use of materials in the tomb complex: the white marble facing into which the gemstones and ornamental stones are laid is reserved solely for the surfaces of the mausoleum itself in contrast to red sandstone used on the mosque, *jawab*, southern gateway and other buildings (Koch, 2005:140-1).

The use of gemstones focused in the area directly around the cenotaphs of Mumtaz Mahal, and later Shah Jahan himself, was observed at the time of construction. The Mughal writer Salih comments that: "All over the interior and exterior of the mausoleum, especially on the platform containing the illumined cenotaph, carvers of rare workmanship, with delicate craftsmanship, have inlaid a variety of coloured stones and precious gems – the jewels of whose description cannot be contained in the ocean of speech.... And compared to its beautiful execution, which possesses infinite degrees of beauty, the masterpieces of Azrang and the picture galleries of China and Europe have no substance or reality, and appear like mere reflections on water..." (Begley and Desai, 1991:79). The poet Kalim also comments on the use of gemstones and the quality of craftsmanship: "They have inlaid stone flowers in marble,/Which surpass reality in color if not in fragrance./Those red and yellow flowers that dispel the heart's grief,/In reality are carnelian and amber." (Begley & Desai, 1989:83).

The gemstones and ornamental stones used for the inlaid decoration of the mausoleum interior spaces are used to create calligraphic, floral and abstract geometric designs. These designs are combined to create a coherent visual effect, although floral motifs are the most prevalent by comparison with the calligraphic and abstract motifs. This combination of motif is common to much Islamic architecture and is entirely in keeping with Islamic stricture that teaches against the use of figural imagery in a religious context. In the Mughal context, Ebba Koch also highlights the association that also developed between royal authority and the specific use of floral decorative motif as an expression of imperial propaganda (Koch, 2005: 147). In relation to mausoleum architecture, it

is fitting that the deceased should be buried surrounded with images of flowers that make symbolic reference to the gardens of Eden, and calligraphic inscriptions that make direct reference to Paradise, reward for the faithful in the afterlife (Begley & Desai, 1989:235-6, 239, 241).

The use of *parchin kari* in Shah Jahani architecture is often reserved for the walls of architectural spaces associated specifically with the figure of the emperor or his immediate family. The mausoleum at the Taj complex is one example. Similar examples include the marble imperial platform in the Diwan-i Am at Agra Fort, the throne platform and backdrop in the Diwan-i Am in the Lal Qila at Delhi; the Diwan-i Khas at Agra Fort and at Delhi; and finally the private residential chambers of Shah Jahan at Agra Fort which overlooks the Taj Mahal itself (Koch, 1991). *Parchin kari* therefore serves as an echo of the royal presence, a royal trademark used in specific areas of authority in imperial architecture. The *parchin kari* of the mausoleum also serves to highlight spaces and features, most notably the upper cenotaphs themselves, that were the focus of various rites carried out as part of devotional acts of spirituality focused on the cenotaphs themselves (Koch, 2006:229).

Description of the Programme

The description of the *parchin kari* programme at the Taj Mahal is limited here to the decoration on the mausoleum itself as the main focus of the complex. Ebba Koch's description of the programme (Koch, 2006:163-177) and the Jean-Louis Nou's images (Okada, 1993) are the main sources of reference - as written discussion and description, and photographic record - together with independent observation. Gemstones and ornamental stones are used to decorate the white marble surfaces of the mausoleum and are focused on the following areas: the lower inner walls of the cardinal *pishtaq*s; the lower walls of the cardinal chambers that lie beyond these *pishtaq*s; the lower walls of the central tomb chamber; the surfaces of the octagonal marble screen inside the chamber; on the upper cenotaphs of Mumtaz Mahal and Shah Jahan; and finally on the cenotaphs of the deceased in the crypt below the central chamber.

The first gemstone inlay appears on the inner surfaces of the four cardinal *pishtaq*s of the mausoleum. The lower walls of the recession created by these arched structures are decorated with dado panels. Within each of these panels are depictions of flowering plants carefully relief-carved in white marble. These long panels, which stretch along the lower part of each wall, are framed with a border of *parchin kari* decoration. Along each side of these borders run outlines in black slate and yellow marble. Within this outline is a continuous pattern of stylised floral motifs organised within a black and coloured marble curvilinear framework that resemble the borders of Mughal flower beds (Koch, 2006:137 and Volwahsen, 1970:95).

This trellis framework can be divided into interlinked subsections of lobed cartouches each dominated by two floral forms. The first, of which there are four in each cartouche, is a bloom of dark green-flecked jasper; the central petal of the three on each bloom has been elongated. Black marble curvilinear links that

join the lobes together have been terminated using two further flowers in green jasper. The second type of bloom is of red and yellow flecked jasper with agate, and has five waved petals of approximately equal length; there are two of these in each cartouche. Neither of these motifs are readily recognisable - they are floral approximations that have no identifying botanical features. At the corners of the dados, the same blooms are arranged around a five-lobed cartouche that neatly navigates the right angle without breaking the visual effect. The stones used for this exterior decoration are predominantly opaque, with little lustre, but bold colour effects.

Parchin kari is also used in the four chambers beyond these exterior recessed arches, creating a sense of continuity between the outer areas and inner decorative scheme. Here it also frames dado panels of flowering plants in relief-carved white marble. The continuous inlaid pattern is similar to that of the *pishtaq* walls, with two minor differences. First, the problem of negotiating the corners is handled using a more complex six-lobed shape with four jasper and two carnelian blooms arranged in a black marble framework. The second alteration is in the five-petalled carnelian flowers themselves; the petals are separately arranged, with the central petal standing upright and the subsidiary four falling down to either side, abandoning the waved impression of those outside and showing a greater sense of individual botanical features in the design of the motifs.

Gemstone decoration is used in these cardinal areas, but not on the walls of the recessed corner arches or interior chambers, where decoration is confined to coloured marbles of black, yellow and white arranged in geometric patterns (Koch, 2006: 176 and Cox & Kennedy, 2000). This careful placing of the gemstone decoration emphasises the cardinal axes of the building, at whose meeting lie the upper cenotaph, and beneath in the crypt the lower tomb, of Mumtaz Mahal (Fig. 1).

A similar type of *parchin kari* is used again on the borders of the relief marble dado panels that extend around the walls and recessed niches of the central chamber of the mausoleum. This use of *parchin kari* running around the dados of the interior chamber, in conjunction with the carved marble flowers, creates a band of floral imagery around the cenotaphs (for a discussion of the imperial significance of this use of floral imagery see Koch, 2005:147). This creates a sense of concentric decorative emphasis around the central area of the tomb chamber (Fig. 1).

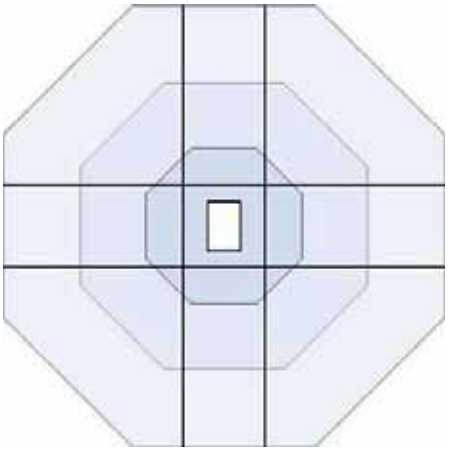

Figure 1: Diagram Showing Hierarchical Zones of Cardinal and Concentric Zones of *Parchin Kari* Decoration of the Mausoleum *(not to scale).*

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The gemstones used in this area of the *parchin kari* scheme include onyx, lapis lazuli, carnelian, jasper and red and yellow marbles, and represent an increase in the variety of stone and colour employed from the outer areas of the mausoleum. There are also some differences in design that mark a progression in the *parchin kari* programme hierarchy from the outer zones. The basic structure of the trellis framework here is heart-shaped with two extended lines curving out of the base to either side (Fig. 2). This shape is turned on its side, and placed first facing one way, and then inversed alternately, to create an ongoing geometric pattern around which to place the floral motifs. Each heart-shaped section has a central five-petalled bloom of onyx and yellow marble, resembling a highly stylised iris. The curved lines are both terminated with a two-part leaf with serrated edges in jasper. At the meeting points of each pair of heart-shapes are two three-petalled carnelian flowers, and at the meeting points of the two curved lines are two four-petalled flowers in agate and lapis lazuli that resemble fuchsias.

Like their outer zone counterparts, none of these floral motifs, given their abstract nature, are identifiable as a particular variety of flower. However, they do mark a progression from those on the outer surfaces on the tomb; the range of stones used is more varied and the designs are of a growing level of sophistication: not only does each bloom incorporate a greater number of types of stone, the attention to detail is greater, as displayed by the serrated edges of the foliage motifs and the increasing complexity of the shapes of the petals.

Figure 2: *Parchin Kari*, Outer Wall of Central Chamber, *Photo: Rupinder Khullar, 2000.*

The next zone of decoration marks a concentric progression in the decorative hierarchy. It begins with the opulently-carved eight-sided marble screen that surrounds the two cenotaphs in the centre of the upper chamber (Fig. 3). The progression is expressed in a number of ways. First, the depiction of flowers is far more elaborate, concentrated either on individual flowering plants growing from mounds of earth or stones, or on carefully depicted individual blooms hanging from complex, often multicoloured arabesque frameworks (Figs. 4, 5). These flowers show both observation and horticultural knowledge in their depiction, although liberty is taken with their precise features, which are often stylised and manipulated in order to achieve a hyper-real sense of beauty that makes their identities less clear. Many of the same flowers identified, including irises, tulips and narcissi (Koch, 2006: 158) are also represented in the marble relief carvings on the walls of the mausoleum, indicating a clear sense of coherence in the

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overall design of the decorative programme. Secondly, the number of gemstones used for each bloom increases dramatically – for instance, the carnelian lotus-type flowers have over sixty pieces in a single bloom (Fig. 4). Thirdly, the quality and rarity of the gemstones used also increases to give a greater impression of expense and opulence.

Figure 3: Interior Chamber, *Photo: Rupinder Khullar 2000.*

Figure 4: *Parchin Kari*, Outer Face of Marble Screen, *Photo: Rupinder Khullar 2000.*

Figure 5: Upper Rail of Marble Screen, *Photo: Rupinder Khullar 2000.*

The surfaces of both faces of each side of the screen, including those of two high doorways to the north and south, are decorated with floral designs. With the exception of the north and south faces, each side of the screen is made of up of three marble jalis, each about one metre wide, with solid marble borders. Along the borders of the screens are series of black marble cartouches around which the designs of flowering plants are entwined. Each cartouche measures 30cm in length and 11.6cm in width. These cartouches are joined with black and red marble links. Three cartouches run along the top of each screen, totalling nine on each horizontal border of the eight-sided screen. In each of these cartouches are arranged flowering plants and foliage, draped elegantly around their black frameworks. On the outer face, these plants are individual fully flowering lotuses, also identified as chrysanthemum (Koch, 2006:171) (Figs. 4 and 6), carefully picked out in various shades of orange carnelian; three tulip buds are symmetrically arranged on either

flank of the central bloom (Fig. 7). On the inner face of the screen, there are seven heads on each cartouche of flowers resembling a variety of tuberose, picked out in carnelian and what is possibly red garnet.

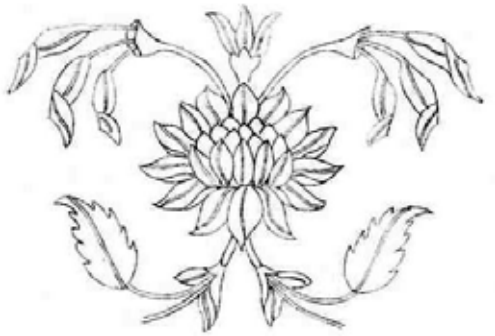

Figure 6: Lotus or Chrysanthemum Flower from Upper Horizontal *Jali* Border on the Outer Face of the Marble Screen.

Figure 7-B.: Examples of *Parchin Kari* Floral Motifs on Marble Screen.

Two vertical borders that separate the three screens in each side have four cartouches on each face (Koch, 2006: 172). On the outer face, these are adorned with upright flowering plants, alternating between lilies of tigers' eye, carnelian, and lapis lazuli and what seem to be delicate fuchsia flowers in tigers' eye and onyx. On the inner face of these panels are four cartouches filled with alternate blooms resembling narcissi and fuchsias (Koch, 2006: 172). The petals and central flute of the narcissi-type bloom and the extended flowers of those that resemble fuchsias and hang downwards from their stems are made of carnelian, jasper and onyx. On the north and south faces of the screen, the middle jali is replaced by a doorway that extends upwards from these borders a further three cartouches to reach over two metres in height. Whilst the spandrels over these arched entrances are decorated with arabesque designs, with a waved yellow stone design stretching across their entirety on both faces of each doorway, the remainder of the border designs are the same as those of the marble panels to either side.

At each of the eight angles of the screen are pinnacles and an extended vertical border, with an extra cartouche. At these corners, the craftsmen were obliged to inlay their designs around the obtuse and acute angles, making their achievement yet more remarkable. The outer angles of the corners are ornamented with five inlaid cartouches, with alternate tuberose motifs of garnet, carnelian and jasper, and fuchsias or honeysuckle of agate, carnelian, lapis lazuli and jasper (Koch, 2006: 172). The inner angles are adorned with vibrant red carnelian poppies with elaborately designed serrated-edged leaves of jasper and

what is perhaps a green quartz or feldspar (Koch, 2006:172).

Between the uppermost sections of these corner pillars, a pierced frieze runs around the top of the screens, decorated with asymmetrical depictions of individual flowering plants. There are two types of plant alternated around the entire screen on the outer face, both made predominantly of a darker brownish carnelian, agate and jasper, are identifiable as tulips and lotuses (Fig. 5) (Koch, 2006:172). The inner face of the frieze is decorated uniformly with plants showing three heads of five- and six-petalled flowers with two small buds below. They are made of jasper with petals of rich carnelian orange, the richly coloured, simply shaped petals similar to the blooms of a champa tree, a member of the magnolia family, which has been identified by David Lentz as being amongst those planted by the Mughal emperors in their gardens (Moynihan, 1999: 49). They also resemble the Mughal artist Mansur's depiction of the Western Asiatic tulip (Welch, 1985: 220). Given the presence of tulip images elsewhere in the mausoleum's decoration, this would seem a more likely identification of this bloom.

There are four standard types of leaf used to depict the foliage of these plants: a folded leaf with a single central vein and smooth edges; a longer, waved leaf with a single vein and straight edges; a serrated edged leaf; and a three lobed leaf with pointed ends. These are made from jaspers, and green stones resembling feldspar or green quartz, all of which occur naturally in India (Rutland, 1974). They are used in equal quantity throughout the screen decoration in a stylised way not in keeping with the true features of the plants depicted. It is of interest that a serrated edge leaf, known as the saz leaf, also appears in much Iznik ware of the sixteenth- and seventeeth-century, which in turn has its origins in Chinese blue and white ceramics (Porter, 1995: 104). The use of these types of leaf is continued in the decoration of the two cenotaphs that lie within the confines of the marble screen.

The final and ultimate zone of decoration appears on the cenotaph of Mumtaz Mahal that lies at the centre of both the decorative and architectural scheme (Fig. 1). That of the emperor was added later, but it retains the stylistic themes of that of his queen, and so maintains a sense of visual continuity (Fig. 3). The cenotaph of Shah Jahan is a few centimetres larger in each direction so that it dominates that of Mumtaz Mahal despite its less prominent position. There are two similar cenotaphs in the crypt below. Each of the four cenotaphs comprises three distinct sections from base to top: the rectangular marble base, three supporting tiers, and the uppermost rectangular marble box (Fig. 3) (Koch, 2006: 167-171).

The cenotaph of Mumtaz Mahal is decorated with a combination of calligraphic and floral motif set into a framework of decorative cartouches and designs. Floral designs decorate the marble base, and supporting tiers and sides of the marble box itself, with calligraphy covering the upper face. Looking first at the base, an alternating series of two types of flowering plants sandwiched between two decorative borders runs around the base of Mumtaz Mahal's cenotaph. One of the plants is purposefully asymmetrical, with flowers

at various stages of bloom depicted within a single image; the plants are carefully created using predominantly jaspers of all hues, mainly green and yellow, combined with carefully chosen, thickly streaked agates and feldspar or green quartz. The images resemble the colours and design of the lily on the outer frieze of the marble screen, a plant known in northern India at the time, and frequently depicted in Mughal manuscripts (Crowe et al., 1972: 194-5).

The second kind of plant is more controlled, with strict symmetry observed in its rather constrained depiction that contrasts well with its exuberant counterparts. The five-petalled flowers are of jasper, feldspar or green quartz and carnelian, and, given their similarity of colour and petal shape to those around them, might be lilies as well. Below these runs a border of stylised floral patterning, whilst above are closed floral buds in carnelian, either alone or in groups of three, which hang from a simple geometric framework. The upper face of the base is decorated with an elaborate marble framework from which all kinds of flowers and buds emanate. The two varieties are a narcissus-type flower and a variety with four, rather square-shaped petals on each bloom, perhaps a poppy or anemone. This symmetrical design is encased within two borders of waved patterns incorporating single jasper leaves with carnelian and agate tulip-like flowers.

The lowest of the supporting tiers above has at its south end an epitaph to the deceased, giving the words of a prayer of angels interceding with Allah for the soul of the deceased (Koch, 2006: 171). The remaining three sides are ornamented with wave patterns of floral motifs. The vast array of gemstones used here includes red carnelian and yellow carnelian or amber, jasper, stones resembling feldspar or green quartz, onyx, opaque marbles and agates. The four sides and top of the rectangular marble box above are covered with elaborately inlaid calligraphic passages surrounded by floral borders (Fig. 9). The passages are taken from the Qur'an (Koch, 2006:171). They make reference to the rewards in Paradise and the gardens of Eden that await the faithful and penitent believer (Begley & Desai, 1989:235). These passages are placed on the pivotal feature of the mausoleum. They are executed in black stone similar to that of the remainder of the mausoleum, but here the diminutive size demanded far greater skill in its execution. As elsewhere, the script is organised into rectangular panels of text.

The cenotaph of Shah Jahan was added to the mausoleum after that of his wife – that it was not originally intended as his last resting place is evident in the asymmetrical location of his cenotaph in an otherwise symmetrical plan (Fig. 3 and Begley & Desai, 1989:141-160). However, the decoration of the cenotaph is in keeping with the remainder of the decorative scheme and follows a similar pattern of organisation with a few changes made to the motifs. As with his wife's cenotaph, a band of individual flowering plants in mounds placed within decorative borders runs around the sides of the base. However, here each of the two types of alternating plants is placed within its own decorative frame of multi-coloured marbles. The frames themselves, which imitate architectural forms, are made from agates, carnelian, jasper, onyx and marbles. The two plants chosen for depiction resemble lilies and crown imperials (Koch, 2006:171), shown in onyx, carnelian and jasper. The crown imperial-

type blooms are of particular interest; on the lower stems are four flowers fully in bloom, whilst above are six delicate buds waiting to open, showing two different stages of the variety's development displayed on a single plant. A border running around the top of the base from which hang yellow and orange blooms of carnelian, or perhaps amber, and opaque green stones.

The upper face of the base shows an elaborate geometrical framework within which both fully bloomed tulip-type flowers and their buds are intertwined amongst the curvaceous patterns. The gems used are dominated by carnelian and jasper, with the flowers and buds extending from opaque black and red marble stems. Other stylised flowers and buds made primarily of carnelian form part of the framework itself and link the designs together in a coherent and graceful way. The sloped sides of the upper part of the cenotaph, like that of Mumtaz Mahal, are decorated with an extraordinary display of gemstones. Here, the three tiers are adorned with highly stylised blooms hanging from curvilinear border patterns.

The sides of the box above show alternating plants within individual architectural frames that echo those on the base. However, here the plants depicted are perhaps tulips in yellow carnelian, or perhaps amber, and rich poppies in vibrant red carnelian. Poppies are identified as flowers of suffering and death, which may be the intended association given the tomb setting here (Koch, 2006:171). The vast array of gemstones used here, together with the carnelians for the flowers already mentioned, include onyx, agates, feldspar or green quartz, jasper, lapis lazuli and other opaque ornamental stones.

The upper face of Shah Jahan's cenotaph, surmounted by the traditional pen box, is dominated, unlike that of Mumtaz Mahal, entirely by floral depictions, both individual plants and floral motifs (Fig. 8) (Koch, 2006:222). At the head of the cenotaph is a circular floral motif within a square. At its centre is an orange carnelian flower with sixteen petals and a rich blue and orange centre. Radiating out from here are eight further blooms – four trumpeted fuchsia-type flowers in rich yellow carnelian alternated with four five-petalled orange carnelian flowers. The fluted flowers have two waved but symmetrical leaves on either side, whilst the others only have small leaves at their bases. This motif is surrounded by a ring of sixty-four round gems, including alternating green stones, perhaps beryls, and orange carnelians. Outside this there are a further sixty-four waved jaspers that resemble the rays of the sun (Koch, 2006:171).

The rectangular panel that comprises the remainder of the cenotaph's upper surface contains an inlaid pen box with further curvilinear patterns around which floral depictions are arranged. Cornucopia motifs also appear as part of the decoration (Koch, 2006:171). At the foot is depicted in a wide variety of gemstones and colours a fully-flowering tulip-type plant. The plant springs from a cluster of smooth-sided leaves at its base, with stems of leaves and carnelian flowers arranged symmetrically around a central spine. This motif, although still not entirely in keeping with nature, is the most elaborate and naturalistic depiction of an individual plant anywhere in the *parchin kari* scheme at the Taj Mahal.

In the crypt below are the two cenotaphs of the Emperor and his queen (Begley & Desai, 1989:104, fig. 45). These cenotaphs are more restrained and meditative pieces than the cenotaphs above. In natural light, they are not immediately visible as one enters the tomb, and in the gloom of the crypt, they are much harder to see than those above. The quality of the craftsmanship is, however, of the same standard as that of the cenotaphs above, but the focus here is on Qur'anic inscription rather than opulent floral displays (Begley & Desai, 1989:238-241). It may have been considered that this would have been a more fitting and sober theme for the markers of the actual graves of the deceased, whilst the cenotaphs upstairs would have provided a display of such wealth and opulence that all who saw them would be in awe of the spectacle. The upper cenotaphs are more easily visible both due to the greater degree of available natural light, and their more spacious and accessible surroundings. It could therefore be concluded that the display of wealth evident in the upper cenotaphs rather than restrained piety of those in the crypt was intended as the dominant message to those who visited the tomb.

The base of Mumtaz Mahal's lower cenotaph bears almost no decoration at all, except for a band of subtle abstract floral decoration that runs quietly around its sides. On top of this relatively plain marble construction sits the upper part of the sarcophagus. Like the cenotaph above, it has three tiers of sloped sides that rise to the rectangular box at the top. These are decorated with further sober bands of floral decoration of blooms resembling tulips, irises and fuchsias in agate and carnelian. The top of the tomb, as on the upper cenotaph, is decorated on its four sides and upper face, with black and red Arabic inscriptions (Begley & Desai, 1989:239, 241). The ninety-nine names of Allah are written in individual red marble frames in three lines of sixteen on each of the long sides of the tomb (Begley & Desai, 1989:241). The upper face has black marble Qur'anic script organised into rectangular panels, with an epitaph at the foot of the tomb (Koch, 2006: 174).

Shah Jahan's tomb is more elaborately decorated and, as in the upper chamber, the emphasis here is not on calligraphy but on floral decoration. The sides of base are covered with geometric frameworks from which hang individual floral motifs. The upper face of the base has a wide, curvilinear wave pattern from which extend ten-petalled carnelian flowers and smooth-edged leaves. The tiered sloping sides have decorative floral wave patterns of blooms resembling tulips, irises and fuchsias, as on the tomb of Mumtaz Mahal, but the treatment of the upper box is different. Although the organisation of an epitaph at the foot combined with the framework of three lines of sixteen cartouches is retained, the ninety-nine names of Allah are replaced by individual flowering plants, alternating between tulip-type flowers and poppies in varying shades of carnelian. The upper face is also decorated with floral motifs. The motifs on cenotaph in the chamber above are echoed here, where the basic design of a round floral motif at the head and rectangular panel with the pen box further down is retained, but the intricacy of the design is diminished.

These two sets of cenotaphs mark the central physical focus of the tomb complex. The

upper cenotaphs are the decorative highlight. This is achieved by a combination of factors: the complexity of motif; the combination of naturalism and stylisation in the floral depictions alongside accomplished calligraphic passages; the use of a wide variety of ornamental stones, gemstones and coloured marbles; the quality of the craftsmanship; and the decoration of all available surfaces in a harmonious and balanced way. It is the combination of these features that distinguishes the decoration of these cenotaphs from the remainder of the inlaid programme. In these ways, they represent the climax of the *parchin kari* decorative scheme. The cenotaph of Mumtaz Mahal, as the original occupant of the tomb before the death of her husband in 1666, is the pivotal focus.

Figure 8: Upper Cenotaph of Shah Jahan, *Photo: Rupinder Khullar 2000.*

Figure 8: Upper Cenotaph of Mumtaz Mahal, *Photo: Rupinder Khullar 2000.*

Conclusion: The Notion of Hierarchy

The *parchin kari* decoration on the mausoleum is organised according to a horizontal hierarchy. The decoration is focused at head height or below to give the greatest visibility possible. As part of this horizontal hierarchy, it is organised according to two further concepts. First, it is arranged according to the four cardinal directions, thereby creating an axial emphasis with the tomb of Mumtaz Mahal as the pivotal feature (Fig. 1). This emphasis is achieved by locating the inlaid decoration first around the carved marble dados of the cardinal recessed arches that dominate the four faces of the mausoleum exterior. It is also placed in the four cardinal rooms that lie behind these high recessions, but noticeably not in the corner

rooms of the eight smaller chambers that surround the central tomb chamber ('Corner Chamber' section in Cox and Kennedy, 2000 and Koch, 2006:229). This hierarchy according to location creates a strong emphasis on the cardinal axes of the building.

Second, the *parchin kari* is organised according to a series of octagonal concentric zones that surround the central cenotaphs (Fig. 1). These hierarchical zones are expressed in a number of ways, each distinct from the others according to three factors. These factors comprise materials, technical design and artistic motif. The use of increasingly rare, colourful and varied stones marks a clear progression from the outer reaches of the building to the climax at the cenotaphs on which the widest variety of materials are employed. The most colourful and translucent stones are also reserved in greatest number for this climatic area.

The technical design of the flowers becomes more complex, illustrated in the increasing numbers of both stones used to create a single motif and elements, comprising petals, leaves and specific botanical features, in each bloom or floral image (Figs. 7). In terms of artistic motif, there is an increasing sense of naturalism and observation in the floral motifs, with the climax reached with the cenotaph of Shah Jahan and the individual plants and complex floral motifs depicted on its surfaces. The frameworks in which the floral images are placed also become increasingly complex in the number and variety of stones used in their execution and in the number of elements included in their design.

This combination of an axial and concentric sense of hierarchy appears in both Islamic and Indian cosmological diagrams reflecting cosmic processes and organisation. In particular, astrolabes, instruments designed to explore the celestial spheres and observe stellar motions, take this form (Ardalan & Bakhtiar, 1973:11, 18, 31). Similarly, the combination of an emphasis on the cardinal directions with geometric shapes, in this case the octagon, is familiar from diagrams and *mandala*s in the *vastu shastra*s and is linked to spirituality and astrological themes (Sutradhar et al., 1997:21; Puri, 1997:25 and 85).

Some sense of vertical hierarchy is created in the contrast in decoration between the upper and lower cenotaphs. The decoration that appears on the upper cenotaphs is far more complex and visually impressive that the subtler echoes on the cenotaphs below. The double-skinned bulbous dome and finial that surmount the building create in architectural form the top of this vertical axis, with the solar motif at the apex of the dome interior creating the inlaid apex of the vertical decorative hierarchy. Again, the upper cenotaph of Mumtaz Mahal is the focus of this vertical organisation.

Understanding how the notion of hierarchy is manifest in the decorative and architectural programme, here specifically the *parchin kari* scheme, at the Taj Mahal first enhances understanding of the over-riding concepts that dictated the eventual appearance of the complex. The *parchin kari* technique used by today's craftsmen who continue to work both in Agra and beyond have also retained their knowledge of the practical methods and materials. Inlaid decorative work is currently being carried out on the Radhasvami Samdhi, a Hindu temple faced in marble within Agra itself (begun 1904), although lack of funds

limit the quality and extent to which this type of decoration is employed. However, without an understanding of this basic concept of hierarchy and how it is manifest in the materials, technical design and artistic motifs of the Mughal *parchin kari* schemes, the continued use of this technique is limited. (Thanks here to Tom Fraser at the Prince's School of Traditional Arts in London for his very helpful comments and discussion of this point.).

The *parchin kari* decorative scheme, and the underlying notion of hierarchy that dictates its overall design, relates seamlessly to the decorative and architectural programme of the Taj Mahal complex as a whole. The relationship between the tomb's architecture and its decoration has been carefully manipulated so that neither dominates, but instead complements, the other to create a symbiotic balance. The hierarchy of decorative form, not only within the *parchin kari* scheme, but in the broader decorative programme, is combined with a sensitive execution of motifs, which are restrained and given plenty of space to 'breathe', enhancing the architectural forms and space around which they seem to weave. It is this sense of unity between architecture and decoration, of which the *parchin kari* of the Taj Mahal is an integral part, which creates an effect of visual opulence hard to equal anywhere in the world.

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