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APT 1990 BOOK OF ABSTRACTS
Montréal RESUMES DES COMMUNICATIONS

Table of Contents / Table des matières

The following table has been established by grouping conference sessions into chapters (A to E) according to the broad themes developed by the conference programme. In each chapter, the papers are organized following their presentation order in each session. Please note that papers were not available for some presentations.

(As much as readability was not compromised, the original texts of the abstracts as sent by the authors, are reproduced in this book.)

Cette table des matières a été formulée en regroupant les sessions du congrès en chapitres (A à E) selon les grands thèmes développés dans le programme du congrès. Dans chaque chapitre, les résumés sont ordonnés selon l'ordre de leur présentation dans chaque atelier. Veuillez noter que les résumés de certaines communications n'étaient pas disponibles.

(Autant que possible, les textes originaux envoyés par leurs auteurs ont été reproduits tels quels dans le présent recueil.)

A. CASE STUDIES / ETUDES DE CAS

1. The Object / L'objet

2. The Action / L'action

3. Catastrophies / Catastrophes

D. PLANNING / AMENAGEMENT

1. Preservation Planning 1 / Aménagement et patrimoine 1

2. Preservation Planning 2 / Aménagement et patrimoine 2

3. Campuses and Institutions / Campus institutionnels

E. POLLUTION & CONSERVATION

1. Issues and Damages / Enjeux et Dommages

2. Assessing Damages / La mesure des dommages

APPROACHES TO THE CONSERVATION OF HISTORIC PLANTING

Mark Laird, Historic Planting Consultant
Painshill Park Trust (Toronto Ont.)

In recent years attention has been focussed on a neglected aspect of landscape conservation, both in North America and Europe: that is, the conservation of historic plants and planting. It would appear that in the next decade this will constitute one of the most significant developments in the way we understand and maintain our heritage of cultural landscapes. Pioneering work in this area has already been undertaken at Het Loo in Holland, Schwetzingen and the Berlin parks of West Germany, at Painshill Park in England and at Monticello in the United States -- to name just the most prominent. As Canada begins to consider further both inventory and conservation of historic landscapes, it will be vital that this aspect is given the attention it deserves.

This paper is intended to offer the following;

1. To provide a summary of approaches to conservation in some of the projects mentioned above. Special attention will be given to the work at Painshill, with which the presenter is associated.

2. To discuss the range of disciplines needed to ensure a thorough study of historic planting: from archaeology to tree surveys and from historical botany to management plans.

3. To highlight the specialized methodology required in examining historical documentation, given that the more ephemeral plants (herbaceous etc.) have mostly disappeared from any particular site. And to focuss on the sources themselves: from the nurseryman's catalogue to paintings and engravings.

PRESERVATION DU PATRIMOINE CONTEMPORAIN: L'EXPERIENCE BRESILIENNE, LE CAS DE BRASILIA.

Marcio Vianna, architecte
Ministère de la Culture (Brasilia, Brazil)

Brasilia est le premier cas d'une ville contemporaine classifiée comme "Patrimoine de l'Humanité" (UNESCO, 1987).

Brasilia n'est pas une "idée pour le futur" qui présentement appartient déjà au passé... Brasilia n'est pas un mythe de plus, dans la galerie du 20ème siècle, pleine de mythes rapidement construits, démythifiés plus rapidement encore et toujours menacés de destruction.

Brasilia est une cité réelle, de deux millions d'habitants, qui croît à un rythme accéléré en s'adaptant aux nouveaux besoins et aux problèmes réels du présent. Brasilia est contemporaine, car elle fait partie de tous les temps et pas seulement de l'âge d'or du Modernisme, déjà dépassé: Cité d'hier, d'aujourd'hui et de l'avenir, car elle se développe a partir de la valeur historique d'hier, la dynamique du présent, la potentialité du futur.

Ainsi, le premier pas, fondamental, consiste à connaitre la ville d'une manière plus approfondie, au-delà des premières évidences superficielles et des lieux-communs habituels dont les erreurs ne manquent pas de se propaguer.

C'est a partir de la vraie connaissance de la ville, que l'on comprendra son rôle dans l'histoire du Brésil contemporain, sous tous les asnects et pas seulement du point de vue de l'architecture et de l'urbanisme. Et c'est par la comprension du rôle de Brasilia dans l'Histoire du Brésil, que l'on saisira immédiatement le rôle de ce nays dans l'architecture et l'urbanisme contemporains à l'echèlle mondiale.

De plus, c'est ainse que le patrimoine contemporain, éxemplifié par le cas de Brasilia, pourra trouver une possibilité d'être traité avec l'imnortance qui lui est due au sein du patrimoine culturel comme un tout, et au sein de l'histoire elle-même.

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Puisse cette brève introduction éveiller la recherche d'une vision différente et plus approfondie du cas de Brasilia, et pour célà on propose la présentation de ce travail, par le chemin inverse: a partir de l'étude du metier de la préservation, cherchant d'y identifier les possibilités de bien contenir et "récévoir" le patrimoine contemporain, venir à l'expérience brésilienne et le cas particulier de Brasilia pour y trouver – pour la question globale, internationale – de réponses étayées par une expérience longue et particulière, et pouvoir tirer, de célà, le meilleur parti possible de tout ce que ce cas présent de pionnier, de conceptuel, de possibilités d'application pour d'autres cas dans tout le monde.

LE PROJET D'AGRANDISSEMENT DU MUSEE DU QUEBEC: D'UNE PRISON A UN MUSEE.

Pierre Bouvier, architecte chargé de projet
Musée du Québec (Québec Qué.)

Le projet d'agrandissement du Musée du Québec à Québec, se réalise actuellement en s'adjoignant les murs d'une ancienne prison désaffectée et en la reliant au bâtiment existant par un ensemble mi-souterrain sur le prestigieux site du Parc des Champs de bataille.

Ce projet inusité s'effectue au prix de plusieurs difficultés inhérentes aux contradictoires fonctions d'origine.

En effet, l'édifice constitué en grande partie de murs porteurs de maçonnerie, établissait une entrave structurale à l'insertion des grands espaces nécessaires aux futurs galeries. Ces mêmes murs complexifiaient énormément la planification et l'exécution de tous les systèmes mécaniques et électriques sophistiqués que nécessite tout musée. Les circulations horizontales et verticales du public devaient demeurer simples malgré la forme très articulée de l'édifice. Le recyclage d'un tel édifice qui se doit d'être effectué selon un esprit scrupuleux de conservation place toujours l'architecte devant des choix difficiles.

Cette communication tente d'illustrer l'esprit avec lequel les difficultés de transition ont été affrontées afin de conserver au bâtiment son intérêt architectural ainsi que l'image d'un vécu s'y rattachant.

RECONSTRUCTION OF THE RIDEAU CHAPEL

Anna Kozlowski, Architect
(Ottawa Ont.)

Authentic architectural components from the interior of the 1888 Rideau Street Convent Chapel were salvaged during the 1972 demolition of the convent building, and were kept in storage until their re-erection, in 1987, within the confines of the new National Gallery of Canada.

The salvaged pieces comprised the wood fan vault ceiling, the cast iron support columns, the high altar, the wood balcony railing, and window sash fitted with coloured glass. The decision was made to treat these pieces as artefacts, to reassemble them in their original configuration, and to display them in a reconstructed setting which would duplicate the proportions and appearance of the original chapel interior.

The following approach was adopted:

. work on original components consisted of cleaning, consolidation, and repair - a conservators' approach.

. the reconstruction was an honest expression of our time, that is, no attempt was be made to create false patinas or otherwise age the appearance of the new work.

Achieving a harmonious blend of surface finishes, old and new, afforded the greatest challenge. Three major components required extensive treatment:

1. The wood fan vault ceiling: Cleaning and in-painting
It was cleaned using cosmetic sponges and a weak solution of Sodium Bicarbonate. In-painting medium was "Shiva" liquid casein, applied mainly with small artist's brushes. The crew were professional art conservators.

2. The cast iron columns: Application of a new "ragged" finish
The columns were first cleaned and primed in a conservation lab. A skilled decorative painter experimented with standard oil alkyd paints, and perfected a technique for reproducing a curious "ragged" finish, matching the pattern of a salvaged original piece. The surface was sealed with a low lustre varnish which dulled the appearance of the new work.

3. The new lime plaster walls: Painting and stencilling
The product used throughout was Keim "Quarzil", a silicate paint which was imported from Germany. It was applied to the wall surfaces using large whitewash brushes, by a general painting contractor. The decorative painting was executed by the same crew who restored the ceiling.

The result is an environment which feels very comfortable. Former patrons claimed that the chapel looks "exactly as it did", which of course, it does not. It has been recreated using contemporary materials and finishes, handled in an honest and sympathetic way.

THERE'S NO SUBSTITUTE FOR OLD-FASHIONED RESEARCH

Deborah S. Gordon
New York State Bureau of Historic Sites (Waterford NY)
Christopher Flagg
Taconic Restoration Center (Hudson NY)

Philipse Manor State Historic Site (administered by the New York State Office of Parks, Recreation and Historic Preservation) in Yonkers, NY, is thought to have been built, or begun, in the late seventeenth century by the first Lord of the Manor, Frederick Philipse I. Originally constructed as a frontier outpost, by the time of the American Revolution it had grown into a lavish mansion. The Loyalist Philipse family lost all their property in the Revolution, and after the war the estate was divided up and auctioned off. The Manor Hall and several hundred acres were purchased and occupied by a succession of wealthy land speculators, all of whom eventually lost their shirts and were forced to sell. The mansion, already considered a "historical relic" in the mid-ninteenth century, was purchased in 1868 by the Village of Yonkers for use as a village, and eventually city, hall. By 1911 the city had outgrown its quarters and the Manor Hall was purchased by New York State and put into the care of the American Scenic and Historic Preservation Society. In 1972, it was made a NY State Historic Site.

The first historical analysis of Philipse Manor was written in the mid-ninteenth century by Thomas Cornell, a civil engineer with the railroad who had roomed in the Manor Hall when he first arrived in Yonkers in 1847. Since that time various scholars --among them E. Hagaman Hall, Fiske Kimball and Hugh Morrison -- have attempted to identify and date the different periods of construction of the building, judging mostly by architectural technology and detailing.

The building has been "restored" twice, once in 1911 and again for the Bicentennial, and New York State is currently undertaking a re-restoration and reinterpretation of the site. As part of this effort, my colleague, Chris Flagg, and I were asked to put together an "Existing Conditions" report on the structure to supplement historical research which had already been completed.

Despite the amount of scholarship that had been devoted to the building over the years, it appeared that the building fabric itself had never been systematically analyzed. This is what we set about doing, using the tried and reasonably true methods of paint and mortar analysis. Our hope was that, even if hard evidence for specific construction dates eluded us, we could at least discover probable sequences, learn where one building campaign ended and another began, etc. etc. This has, indeed, proved to be the case. In our paper, we propose to discuss the existing scholarship upon which our efforts were based, and to follow our own investigations through to their conclusions.

FALLINGWATER: HISTORIC FINISHES & COLOURS

Ilene R. Tyler
Quinn Evans/Architects (Ann Arbor Mi.)

Fallingwater has twice been cited by the American Institute of Architects as the most successful example of American architectural design. Originally commissioned by the Kaufmann family as their home on Bear Run, since 1963 it has been open to the public as a living museum. Numerous books, lectures, magazine articles, and video programs document the history and contribution of the home to our architectural heritage. This paper will not attempt to duplicate preceeding work, but will address the specific area of historic colors and coatings used on the concrete and metal surfaces.

In the fall of 1989, QUINN EVANS/ARCHITECTS was hired to investigate the original colors of historic coatings used on the concrete and metal surfaces at Fallingwater. In spite of the significance of the building and the attention focused on it over the years, the original coating colors have never been established. Thus there existed the possibility of incremental shifts away from the original colors at each cycle of repainting. Our firm used the services of Frank Welsh as a consultant for this project, as he is a highly regarded expert in the field of historic paint analysis. Together we visited the site to determine, with the involvement of Lynda S. Waggoner, Curator and Administrator of Fallingwater, specific locations for removing samples for analysis in the laboratory.

Twenty samples of coating material were taken from various locations. From these, Mr. Welsh selected 10 samples for further analysis in the laboratory, as these retained the best evidence of the original and later paints and their colors.

Selection of locations from which to take samples was based on known painting history of the house and professional experience. Although the entire exterior concrete surfaces had been sandblasted in 1976, it appeared that the middle bay under the living room would have the best opportunity for original coatings to remain intact. Other exterior samples were taken, but showed only newer paint coatings applied after the sandblasting.

Metal paint samples were taken at the interior and exterior for sash and trim coatings as well as inside the radiators. Old sash and doors stored off site were inspected for original colors.

Inside the house, samples were taken in locations less affected by ultra-violet light and less likely to have been extensively scraped in preparation for repainting. Typical locations were behind light fixtures or switch plate covers or inside closets. There was also an attempt to be as unobtrusive and non-destructive as possible in removing surface material.

The purpose of the study was to identify the number of layers of coatings, their nature, and color. The Munsell Color System was used for color matching of the samples.

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The presentation will illustrate the findings of the study, including slides of the site, the sampling process, and cross-sectional photo-micrographs of two samples taken at plaster and one taken at metal.

Results of the color and coating analysis give a clear indication of original colors used at cement and metal surfaces of Fallingwater. How this information is used will be part of a decision for future restoration to take place at Fallingwater.

LIVINGSTON DEPOT CENTER REHABILITATION

David L. Leavengood, Architect
Leavengood Architects, AIA (Seattle Wa.)

The Northern Pacific Railroad commissioned, in 1902, the New York architectural firm of Reed and Stem to design a new Italianate Depot for Livingston Montana. The structure was to mark the gateway to Yellowstone National Park. The Livingston Depot Center has become a satellite museum of the Buffalo Bill Historical Center. The central structure house the changing exhibition from the parent museum.

The existing structure is (3) stories of unreinforced brick exterior bearing walls with extensive use of teracotta ornamentation at the cornices, pilaster capitals, window details and floor banding. The roof is constructed of steel trusses with heavy-timber purlins and decking. The major exterior feature is the track side courtyard defined by the open colonnade on three sides. The roof covered colonnade connects three separate buildings, i.e., the central depot, baggage room and restaurant. Since the museum's collection required a special interior climate-control system for the relative humidity and temperature, insulating the exterior walls, which have noble finishes, presented a problem. It was decided in order to preserve the interior finishes for viewing, the museum would only operate for six months of the year.

The interior finishes of terrazzo wainscotting with extensive three colored mosaic tiles were restored and replaced throughout the museum. This task was first complicated by the necessity of structural reinforcement for seismic requirements. Existing windows are infilled with removable display panels which also provided thermal insulation and security. The existing steam tunnels were economically converted into air ducts for a low velocity forced-air critical environment for fragile display objects. Suspended lighting was designed to provide lighting to both architectural features including the deep relief coffered ceiling and museum displays.

THE BUILDING IS MOVING

Henry J. Browne, AIA
Browne Eichman Dalgliesh Gilpin Architects
(Charlottesville Va.)

When the City of Fredericksburg vacated Old Town Hall as a government building in the late 1970's many local citizens accepted the challenge of finding a suitable use for this historic structure. The Old Town Hall Committee initiated the concept of using the building for the benefit of the public and, with community support, proposed plans to convert the building to a museum to house objects from Fredericksburg's venerable past.

Several challenges developed in converting Old Town Hall into a museum. The initial survey revealed structural and fabric damage to the building. Also, the appointed Executive Director for the museum identified a variety of problems which would affect the building's use as a museum.

The paper addresses the architectural and technical challenges relating to the massive walls shifting in the foundation, efforts to stabilize and waterproof the structure, the necessity to maintain the integrity of the structure, the reversibility of the exposed 20th Century intrusions, the necessity to bring a public building into code compliance and the preservation of the exterior fabric.

Further, the paper includes the inherent conflict between the position of the Museum Director and his museum collection and the historic architect's responsibilities in the preservation of an old building, without favoring one to the detriment of the other. The programmatic requirements developed for Old Town Hall will be discussed as well as the modifications necessary to accommodate a modern museum (i.e. environmental controls, electrical and security systems, elevator, etc.).

The paper stresses the cooperative effort required by architect, museum staff, engineers, exhibit designers, preservationists and representatives of the local community. It is imperative that each group understand the widely varying needs and requirements necessary to create a working museum in a pre-existing building.

Slides will be presented of the entire removals and archaeological work. Also accompanying the presentation will be drawings in cartoon form indicating the methodologies of inserting an interdictory courses to stabilize the original Aquia stone which is subject to rapid decomposition and the introduction of unique and well integrated structural design against lower level walls which were shifting.

EARTHQUAKES & PRESERVATION: LESSONS FROM SAN FRANCISCO

Sven E. Thomasen, Affiliated Consultant
Wiss, Janney, Elstner Associates, Inc. (Emeryville Ca.)
Carolyn L. Searls, Consultant
Wiss, Janney, Elstner Associates, Inc. (Emeryville Ca.)

On October 17, 1989, an earthquake named for the nearby Loma Prieta mountain occurred on the San Andres fault south of San Francisco. The epicenter was on a segment of the fault associated with earthquakes in 1865, 1890, and 1906. The Loma Prieta earthquake had significant impact on structures and buildings in cities around the epicenter and in Oakland and San Francisco approximately 100 km to the north.

The Loma Prieta earthquake caused few structural collapses but the building damage was extensive. Much of this damage was suffered by older and historic buildings constructed before seismic codes were first adopted around 1932. The seismic codes were enacted to prevent collapse and loss of life and the behavior of newer buildings attested to their value. But most older buildings do not conform to modern code standards and seismic upgrading is often economically impractical or in case of historic structures physically unfeasible without significant damage to their historic value.

Seismic activity occurs in many regions and it is therefore important to assess some of the lessons from the San Francisco earthquake:

1. Damage to all historic structures needs immediate attention, documentation, and detailed follow-up investigation and the question of demolition needs to be carefully evaluated.

2. In the panic following the quake indiscriminate demolition is popular. Building officials and engineers can become overcautious and some owners see a chance to get rid of an unwanted structure.

3. Historic buildings should be inspected and analyzed by engineers familiar with that period of construction. The engineer must balance the desire of the owner to occupy the building with a minimum of repair, the desire to minimally disturb the historic fabric with the need to provide life safety in the case of future earthquakes.

4. Fast emergency measures such as bracing and timber shoring will reduce immediate hazards and secure time for a proper engineering evaluation.

5. Listed historic structures may be saved from immediate demolition, but many structures of equal or more historic value are not listed.

6. Once the immediate emergency response is over, building officials need to provide workable guidelines which engineers can use to design repairs to get buildings back in service.

HURRICANE HUGO RECOVERY, CHARLESTON SC

Jonathan H. Poston and Connie Wyrick, Historic Charleston Foundation (Charleston SC)

The architectural character of Charleston (S.C.) and its vast heritage of period buildings and their contents were placed at great risk during Hurricane Hugo on September 21/22 1989. A category 4 storm, Hugo battered the South Carolina coast with winds of 135 - 150 mph and a flood surge of 11 - 20 feet. In its path, the hurricane left widespread havoc and destruction. The material cost of the hurricane has been estimated to be over 6 billion dollars to South Carolina.

One of the seriously impacted areas was Charleston's "Old and Historic District," which is the oldest in the United States. The district covers approximately 25% of the city land mass and includes more than 3,600 rated buildings. Approximately 80% of these structures received some degree of damage during the storm. Immediate reconnaisance indicated that the majority of these structures has suffered extensive roof damage which exposed interiors to threatening moisture problems. Disaster recovery assistance provided by preservation organizations proved to be crucial to the recovery effort.

South Carolina preservationists were joined by hundreds of preservation technologists, building trade officials, civil engineers and historic preservation architects to plan and execute a comprehensive emergency stabilization and recovery plan. They surveyed and photographed individual damage, gave preservation and stabilization information and monitored repair work. These efforts and their results will be the subject of reports presented by two staff members from Historic Charleston Foundation.

NATURAL CATASTROPHES AND HISTORIC LANDSCAPES: SOME IMPLICATIONS FOR DISASTER PLANNING

Robert R. Harvey, Professor
Department of Landscape Architecture, Iowa State University (Ames Io.)

"Natural Catastrophe and Historic Landscapes; Some Implications for Disaster Planning"

Landscapes are characterized by dynamic change. Wind, snow and ice, drought and fire possess a potential for disaster when their forces are unleased catastrophically within the historic landscape.

This paper will illustrate with photographic images the disastrous effects of the recent hurricane force winds in Great Britain. Bath, Blenheim, Chiswick House, Claremont and Painshill Park are a few of the examples to be investigated.

Storms of disastrous proportion have been chronicled during the 17th and 18th centuries in England and Northern Europe by such notated writers as John Evelyn, William Congreve, William Temple, and Daniel De Foe. The implication therefore exists that such events are not isolated but can occur repeatedly over a span of time.

While no amount of pre-planning can prevent a natural disaster from occurring, it can aid in the prevention of inappropriate action during and following the occurrance of the event. Management plans, restoration plans and disaster plans can in some cases help mitigate the amount of damage if in place prior to the natural disaster. In some instances, the disaster might even be accelerated by management procedures that defy natural processes; i.e. the summer of fires at Yellowstone National Park, Wyoming, U.S.A. in 1988. The Yellowstone region is a natural fire ecology and fire events of the magnitude of the summer of 1988 have been documented during the 18th century. A "no burn" policy from 1872 to 1972 contributed to the fuel available that ignited into the holocaust during an abnormal period of drought.

GEL ET CONSERVATION DE L'ARCHITECTURE

Jean-Paul Saint-Aubin,
Ministère de la Culture (Paris, France)

A Rome en 1963, Walter Frödl a remis en question, d'une certaine façon, la notion même de monument historique. La hiérarchie des valeurs affirmées par Riegl, de l'histoire, de l'esthétique et de l'usage y était bousculée et cette analyse critique rend nécessaire une révision courageuse et franche qui adapte à nos moeurs actuelles, aux nouveaux points de vue qu'elles supposent les ambitions de conservation matérielle de l'architecture et celles plus diffuses de conservation intellectuelle.

Et de fait, le vocabulaire même a changé, il est maintenant question de patrimoine et de sa protection. Pourtant il convient de remarquer que le territoire du patrimoine reste un espace flou, que ses frontières sont changeantes et évoluent au fil des années. Malraux parlait de ces oeuvres qui n'étaient point inconnues mais qui n'étaient qu'invisibles ; notre époque veut refuser toute cécité.

Le patrimoine est un univers en pleine expansion ; ce n'est pas évidemment sans poser de problèmes de définitions, de lexicologie ou de typologie et sans mettre en péril dans nos sociétés "économiques" le fragile équilibre des moyens financiers disponibles pour assurer la conservation.

Mais doit-on tout conserver et le peut-on ?

Les pratiques, sinon la doctrine de la protection matérielle ne font finalement que refléter la mythologie du "tout patrimoine" et qu'affirmer un retour du réel avec les impératifs techniques de coût, de spéculation foncière, de plus-value liés aux restructurations rigides des espaces urbains. Sans aller jusqu'à faire des procès en sauvetage, il est évident que tout geste réparateur gomme le contenu historique de l'édifice ; il n'y a pas à justement parler de scénographie réversible à tout égard. Il n'y a pas de chirurgie innocente, mais le risque serait plus grand encore, par purisme, de fermer les yeux pour les rouvrir sur les décombres.

D'un autre point de vue, le gel de l'architecture urbaine ne bloque-t-il pas l'innovation en la mesurant à l'aune du passé ?

L'équilibre est étroit, le chemin sinueux entre le haut-le-coeur effarouché de l'historien et l'action attentatoire de l'architecte, mais il est à trouver si les pouvoirs qui organisent nos sociétés décident la conservation matérielle d'une certaine image mentale de nos civilisations. Il faut alors s'en donner les moyens par le recours à toutes les ressources du savoir, des technologies et de l'habileté.

L'ECONOMUSEOLOGIE

Cyril Simard Ph.D., Président
Commission des Biens culturels du Québec (Québec, Qué.)

Renouveler le patrimoine ethnologique

Au-delà des pierres et des instruments, il y a les porteurs de traditions, les transmetteurs de savoirs.

Pour assurer "in vivo" cet héritage de nos techniques et des métiers traditionnels, le conférencier propose une approche pratique dans une option de renouvellement et de continuité.

A l'aide d'une vidéo-cassette (VHS-anglais-français) de 12 minutes expliquant le concept de l'ÉCONOMUSÉOLOGIE, le conférencier développera les trois points suivants:

- La portée économique et culturelle des porteurs et transmetteurs des savoirs traditionnels.
- La conservation du meilleur de la tradition dans la production actuelle des biens.
- La promotion de l'identité régionale.

En somme, réactualiser la tradition, c'est promouvoir le patrimoine et lui parler d'avenir.

THE ONTARIO HERITAGE FOUNDATION'S HISTORIC PROPERTIES

Richard Moorhouse, Executive Secretary
Heritage Trust (Toronto Ont.)

The Ontario Heritage Foundation (OHF), as a non-profit government agency responsible for the provincial Trust, has chosen in the past few years to undertake innovative and creative approaches towards the research and restoration, education and marketing of its properties. Such a strategy was founded on the desire by the Foundation to broaden the base of public awareness on conservation and capture the interest of non-traditional supporters. The resulting financial and moral support by volunteers, private sector corporations is now assisting in meeting the increasing challenges of effectively preserving its properties into the 21st century.

By establishing sound project management, educational and marketing principles, objectives and strategies, the Foundation is integrating more of its traditional conservation activities into the mainstream. Such action highlights that heritage can be a business that ensures financial self sufficiency without compromising public access or the architectural integrity of historic properties.

The Foundation over the past three years has applied these principles and approaches to over 50 million dollars worth of conservation work on its properties. These funds have been obtained through provincial and federal funding programs and from the private sector.

A significant portion of these funds has been utilized for the restoration of three national historic sites in Toronto: the 1913 Elgin Winter Garden Theatre Complex; the Birkbeck Investment Building into the Ontario Heritage Centre and the 1876 George Brown House. Restoration has just begun on the national historic Barnum House in Grafton, a 1820 neo-classical residence.

The next few years will see the Foundation continuing to grow and change to meet the challenges and issues as more of its properties are conserved. The current approaches applied will continue to be evaluated and developed.

BUSINESS ALTERNATIVES FOR FINANCIAL SURVIVAL

Susan Cargill-Johnson, Property Marketing Unit
Ontario Heritage Foundation (Toronto Ont.)

To adjust to changing times and pressures from increasing costs and decreasing budgets, The Ontario Heritage Foundation now takes an innovative approach to the restoration of its properties. As provincial custodians of historically significant sites, the Foundation has chosen to assess each building with a view to its financial and marketing viability. To effectively address these issues, a team of marketing professionals work closely with the Restoration team to ensure each project fulfils the objectives of financial self-sufficiency and public access, while preserving the architectural integrity of the building.

George Brown House, the Ontario Heritage Centre, the Elgin and Winter Garden Theatres, and Ashbridge all incorporate various multi-use approaches suited to the building, its location, and to the community. These properties incorporate a multi-use philosophy which creates a situation where people who may never have visited a historic site as a museum are now exposed to the history and the story of its restoration while using the conference, theatre or office facilities.

As restoration is undertaken on other properties, the Foundation continues to explore marketing opportunities that will generate revenue and promote our message to new and broader audiences.

TRANSFORMATION AND THE PROGRESSIVE USE OF ARCHAEOLOGY

Dena Doroszenko, Archaeologist
Ontario Heritage Foundation (Toronto Ont.)

The demands of a non-traditional approach to many of The Foundation's historic properties has led to the progressive transformation of the traditional role of historical archaeology on these sites. During the period of 1974 to 1990, archaeological research has been conducted on twenty historic properties. George Brown House, Barnum House, the Ashbridge Estate and Inge-va are project examples of how The Foundation has effected major changes within its research program. Archaeology now plays an important role not only before restoration of a structure but also during the process and most particularly after work has been completed.

The importance of public access during the entire project now influences how future projects will be designed to allow for public educational opportunities and links with local school boards.

The commitment to the preservation of a historic site carries with it a commitment to the preservation of the archaeological resources in the soils of that property. Archaeology is a long-term commitment, it does not end with the submission of a research report. The artifacts exist - and take up space. Retention of artifacts is required by law in Ontario and is also reinforced by a moral and professional responsibility to insure long-term care of collections. This growing emphasis on collections management within the archaeological program has presented challenges to The Foundation in addressing how a collection may be used beyond "pure" research interest. Issues that have plagued archaeologists for years include the ultimate disposition of artifacts, and selective discard of artifacts. More importantly, instituting a dynamic approach to ensuring that the artifactual material will be put to full use , whether in a display format within the structure or generally incorporated into the interpretive plan for that property, goes beyond the "handmaiden to history" role that historic archaeology has traditionally followed.

PROGRAMMING FOR THE NON-TRADITIONAL ENVIRONMENT

Stephanie Croft Hussey, Education and Promotion Officer
Ontario Heritage Foundation (Toronto Ont.)

The financial reality of operating an historical site today has led the Foundation to broaden the parameters of its educational programming. George Brown House, the Elgin and Winter Garden Theatres and the Ashbridge Estate are all properties owned by the Foundation which harmonize conference facilities, office space and interpretive programming.

The challenge of creating an exciting educational programme within a mixed-use facility has led to interpretative components which successfully communicate important preservation messages to both traditional and non-traditional audiences.

Introducing educational programming on the construction site through a series of technical case studies has meant that professionals in the restoration field are given practical information which can be applied in their daily work. The information they receive goes hand in hand with the principles of good conservation practice presented by the Foundation in its "how to" manual: Well Preserved, published in 1988.

The Foundation not only uses its properties as teaching tools for professionals, but involves the community in its projects through special events, tours and out-reach programmes. This programming also serves to stimulate interest in corporate groups to participate in projects through sponsorship and donations. Educational programming using "The Site as Artifact" have been established and are operated through volunteer programmes.

Educational programming, an integral part of the Foundation's work, is tailored to fit the unique requirements of each property, be it a conference facility, theatre, or house museum.

CREATIVE ACCOMMODATION

Lawrence Kavanagh, OAA
Property Restoration Unit, Ontario Heritage Foundation
(Toronto Ont.)

The conservation principles of the Foundation. Financial stability. Educational programming during the construction. Historic archaeology. Conference marketing. Building service upgrades. Curatorial requirements. Life safety of users and visitors. Retention of historic fabric. Limited budgets. Fixed schedules for completion due to tenant commitments. Where's an architect to begin?

The historic building itself remains the answer.

Programmes for re-use are developed in concert with the considerable research work undertaken by an integrated team of recorders, historians, technologists and archaeologists under the direction of the Foundation Architect. The work uncovered forms the basis for establishing the conservation philosophy particular to that project used by the planning team made up of each representative area - Marketing, Research, Education and Architecture. Respective demands are balanced and compromises made, but never at the expense of the reasons why the Foundation owns the property - the significance of the building as historic artifact. Even with all of the special requirements, projects are handled by in-house staff and completed within tight time frames for fixed budget amounts that make the finished project costs competitive with standard building developments. The Work follows standard building practices and procedures in order that others might learn from our innovative approaches. The communication of this important information to developers, the design profession, the public, the contractor on the job and the members of the implementation team is best demonstrated during the course of construction. By taking chances and testing the boundaries of traditional building preservation, the Foundation fulfills its mandate of Leadership by Demonstration.

FAÇADISM IN TORONTO

Michael McClelland
(Toronto Ont.)

In Toronto there is an increasing number of urban development projects within the city's central core which retain only the facades of heritage buildings. Local conservationists have complained frequently that these retained facades have lost their meaning, that they are a sham, or misrepresentative of the interests of the heritage preservation movement. This concern for the lost meaning of the facade is indicative of a deeper unease with the city's urban morphology. The morphological changes within the city's core, which can be demonstrated both by modern land ownership patterns and building typologies, have altered the traditional relationship between public and private space, rendering the building facade unessential either as a threshold or as a representation of the building's presence within the public realm. While it is possible to establish guidelines which make the interface between retained facades and new construction more compatable, the larger and more ambitious task lies with the architectural, preservation and planning communities working together to rehabiliate public urban space.

In this brief presentation slides will be shown of projects in Toronto, either just completed or still under construction, (BCE Development, Scotia Plaza and 100 Yonge Street) with emphasis placed on their effect on restructured public space.

Facadism in restoration may entail the removal, salvage, and conservation of components of an historic structure for reconstruction in a new facade. This process presents a complex preservation problem from both a technical and cultural perspective. Technically, facadism requires removal of building components without damage or destruction. It demands their reinstallation to match in some degree the historic appearance of all or part of the original facade, while integrating a new substrate or structural system. New details must be incorporated to accommodate original building components and new structural systems.

Culturally, facadism presents conflicting issues for a preservation project. To save only the facsde of an historic structure may not be regarded as preservation in the strict sense of the word; however, to lose a building, facade and all, may be worse than to salvage and recreate its elevations.

As a preservation technique, facadism may be acceptable only as a last resort. Although the conservation of the historic fabric may be technically excellent and aesthetically successful, it is unlikely that the results will be considered a victory for preservation. It is also unlikely that the preservationist will be satisfied with facadism as a solution.

The historic Winch, Times, Driard, and Marks & Spencer Buildings formerly occupied a site near the center of downtown Victoria, British Columbia. The Winch Building, constructed in 1912, was a two-story structure with a Classical white glazed terra cotta facade. The Times Building was built circa 1910 as the headquarters of a newspaper company. The facades were constructed of brick and sandstone with a sheet metal frieze and cornice. The Driard Hotel had eclectic brick and sandstone facades and ornamental cast iron panels. The Marks & Spencer Building was constructed as a Kresge drugstore. The two-story brick facades were decorated with ornamental polychrome terra cotta panels with an Art Deco motif. Together, the four buildings comprised an interesting and

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Deborah Slaton
Wiss, Janney, Elstner Associates, Inc.(Chicago Il.)

decorative historic core for this portion of the downtown commercial district.

In 1987, prior to our involvement in the project, it was decided that these four historic structures would be demolished to make way for new construction, the Phase II structures of the Eatons Victoria Development. It was also decided at that time that the decorative terra cotta, stone, and metal elements of the four facades would be retained and partially reconstructed as part of the new Phase II facades. The solution was a compromise measure between the developer, and the City and concerned citizens of Victoria. Our firm was asked to provide consulting services for the conservation, preservation, repair and restoration of the salvaged terra cotta, stone, and metal elements.

The presentation for APT90 will focus in detail on one project at the Eatons Victoria development, the preservation of the terra cotta Winch Building facade. The options which were considered for dismantlement of the building will be discussed, and the selected process described. The presentation will also address the survey of the facade before and after dismantlement, the restoration of the terra cotta units, and their reinstallation in the new structure.

Although the authors did not become involved with the Eatons Victoria project until the decision to dismantle the historic structures had been made, we have had to address the philosophical as well as technical issues of facadism during our work on the project. The presentation will also address some of the cultural issues of facadism, and invite audience comments on how preservationists can best address this controversial issue in the interest of conserving our heritage.

PRESERVATION AND ENGINEERING - CONSERVATION ET CONCEPTION STRUCTURALE

Jacques Chartrand
Nicolet Chartrand Knoll Ltée (Montreal)

Within the framework of the planning and construction of the World Trade Centre Montreal it was decided to preserve the 19th Century façades along St. James Street, in Old Montreal, and to integrate them in the new project as witnesses of a past era. The presentation will attempt to illustrate how the preservation of these façades may have interfered with construction and to highlight the costs associated with the operation.

Taking as reference the recycling of various buildings from the beginning of the 20th Century, such as the Windsor, the Dominion Square Building, McCord Museum, Sun Life Building, the discussion will also cover the complex problems associated with the preservation of the original character of these buildings as well as touch on the availability of same or compatible materials.

Dans le cadre de la réalisation du Centre mondial de commerce de Montréal, il fut décidé de conserver les façades du 19ième siècle, le long de la rue Saint-Jacques, dans le Vieux Montréal, et de les intégrer dans le projet à titre de témoins du passé. La présentation s'attachera plus particulièrement à démontrer comment la conservation de ces façades a pu interférer dans le processus de construction et quels furent les coûts associés à cette opération.

En prenant pour exemple le recyclage de divers bâtiments du début du 20ième siècle, tels le Windsor, l'Édifice du carré Dominion, le Musée McCord, le Sun Life, la discussion portera également sur le problème complexe que constitue la sauvegarde du caractère original de ces bâtiments ainsi que sur la disponibilité des mêmes matériaux ou de matériaux compatibles.

LONG TERM CONSOLIDATION AND CONSERVATION OF SOIL PROFILES IN URBAN ARCHAEOLOGY

Peter A. Rathbun
Rathbun Associates (Hollandale Wi.)
W. Brown Morton III
(Fredericksburg Va.)

In 1970, the Roman Catholic Cathedral of Louisville, Kentucky was drastically remodeled, removing much of the interior's Gothic Revival character. In the early 1980's, a revitalization initiative resulted in a decision to use the building's heritage as a guide to its rehabilitation. Historic preservation consultant, W. Brown Morton III, advised the Cathedral to prepare an historic structures report. Rathbun Associates, with Morton, prepared this report. The report revealed the buildings evolution, and also the site's pre-history. Within the outer walls of the present Cathedral was the site of the earlier Cathedral and other buildings. When planning began for the renovation of the building, a team composed of the preservation consultants, a liturgical consultant, and an architectural firm were retained. In this planning, it became clear that the Cathedral's basement would be adopted to a new use. The historic preservation consultants urged archeological testing in the basement. The Cathedral Heritage Foundation, charged with the revitalization, authorized this. Floyd Mansberger, an archeologist, discovered substantial remains of buildings and landscape features related to the former Cathedral, and also to important extant Catholic institutions.

In light of these findings, Morton and Rathbun recommended to the Foundation that the finds be included in situ in the proposed Cathedral Museum. Planning, as well as the proper presentation of the archeological remains required the preservation of a number of soil profiles, soil masses, and soil walls. However, after being exposed for a few weeks, it was discovered by the preservationists that the soil was beginning to dry out. Significant cracks developed in the surface and small sections of soil fell out of the vertical soil faces. The preservation team began a research effort to determine how to preserve the soil. Mary Rathbun conducted extensive research, talking to archeologists, paleontologists, geologists, soil scientists and others to determine approaches for soil preservation without significant appearance changes. It was determined that there was no accepted, tested, and reliable technology for this specific application and experimentation would be needed. A number of techniques were selected for on-site testing to determine the best means of soil preservation. These experiments, using different materials, approaches, and applications of materials will be described in this presentation. The experiments were intended to determine a method to increase the outer surface soil strength, particularly on the vertical faces, and to reduce the moisture loss within the soil, thus allowing the soil to retain much of its sheer strength which is necessary to hold its vertical faces. Experiments have been conducted using both low-tech materials such as glues or masonry sealers and ranged to high-tech solutions such as the latest in polymer plastics. These were used in different concentrations, application methods, and with different combinations of materials to ascertain the best means of strengthening and preserving the soil.

This work will analyze in-situ archeological display soil preservation methods. This is not an isolated problem and is very important to urban archeology.

RECONSTRUCTION OF STRUCTURES AT DIR'IYAH, SAUDI ARABIA

Michael Emrick, AIA and Carl Meinhart, FAIA
The Office of Michael Emrick, AIA and Carl Meinhart, FAIA
(Nashville Tn.)

The deserted city of Dir'iyah, impressive today even in its ruins, is the foremost physical symbol of the longest ruling dynasty in the Arabian peninsula- the dynasty of Sa'ud. Established in 1446 as a farming homestead, Dir'iyah grew from a few family houses to respectable township size through a combination of successful agriculture and local leadership.

The Saudi rulers gave refuge to the reformer Muhammad b. Abd al-Wahhab in 1745. Joining his cause to promote morality and pious government, the Saudis became leaders of a reformist government which grew over the next 70 years to encompass nearly all of the Arabian peninsula.

In 1818, at the peak of its expansion, the Saudi state suffered a severe setback when the invading Egyptian army determined to destroy the Sa'ud dynasty, beseiging and finally leaving their capital, Dir'iyah, in ruins.

Following a brief presentation on the significant history of this site, this paper will present the traditions and techniques of the use of adobe as a building material. Techniques vary at the site from a strict use of adobe to the integration of stonework, both as foundations and as an internal, stabilizing material in the adobe walls.

The discussion of current site preservation, interpretation, and building reconstruction efforts will include not only an overview of the approach taken by the Saudi Arabian Department of Antiquities and Museums for the entire site, but also three projects: the al-Turaif Citadel fortification walls, the Palace of Omar, and the Suhaalat and Mosque of Moudhi, projects for which our firms have been responsible. In the case of the three projects, stabilization and restoration approaches, methodologies, and engineering solutions will be presented.

Work at the site involved researching the history of the individual structures, investigating and analyzing the surviving structural remains, understanding and developing traditional building crafts and techniques, and developing stabilization and interpretive plans for these particular structures in the al-Turaif Quarter. A major problem in researching and analyzing the structures of Dir'iyah is the devastation they received at the hands of the Egyptian army. This, in combination with 130 years of neglect and weathering, has left many structures only as wall fragments. As a result of the rapid growth and development occuring in the Kingdom, in Riyadh, and in the new Dir'iyah suburb in particular, there are fewer and fewer comparable surviving structures on which to base research.

FOUNDATIONS FOR THE IVORY TOWER: A PROFESSIONALLY ORIENTED PRESERVATION SPECIALIZATION

David G. Woodcock, AIA, RIBA, Professor of Architecture
College of Architecture, Texas A&M University (College Station Tx.)

Since 1977 the College of Architecture at Texas A&M University has offered graduate level courses in historic preservation as elective courses in the professional degree, Master of Architecture, program. Over the last five years this sequence has developed into a course group that is available as a specialization in the professional degrees in Architecture, Landscape Architecture,and Urban and Regional Planning. It will also be available in a non-professional degree through the proposed Master of Science degree in Architecture. The nature of the courses and the faculty are discussed in the paper, as is the relationship between the academic programs in the College of Architecture and other supporting fields in the university, and the Center for Historic Resources, a research center in the college providing support and focus for university-wide activity.

Of particular focus is the development of interdisciplinary learning and the connection with professional practice, both through research and by a series of visiting lectures and field visits. In the area of preservation technology the paper describes a prototypical course that addresses the general concepts of preservation technology as it relat to the sound practice of historic preservation for buildings. With over 50% of all work in architects' offices involving existing structures, this course is proving of great interest to students who may not choose to be identified specifically with preservation. The course uses a balance of classroom instruction, recent or on-going case studies presented by practicing professionals selected to make direct reference to the course content, and a series of field visits. The course output includes documentation of case studies, published through the Center for Historic Resources, which allows the student to become familiar with sound practice techniques and disseminates knowledge to the profession. The first case studies will be published in the summer of 1990.

STONEWORK BY FOREIGN HANDS

Jonathan Aluisio Raible, Restoration Architect
Swanke Hayden Connell Architects (New York NY)

Throughout the history of this Nation. New York City has been considered and still is the gateway for immigrants coming to this country. Together with their cultural baggage, the flux of new arrivals came with hope, energy and a variety of crafts and skills with which they left their mark over the years on the unique and varied architecture of the City.

In the latter part of this century, due more in part to economical plight, rather than political or religious reasons, the majority of "new" immigrants to the City have tended to be less educated and skilled but indifferent to hard work. From dishwashers to nurses they have filled a gap in the labor market left by the already "established" Americans.

In Preservation, workers of varying nationalities have infiltrated in all areas of the field. However, in the highly specialized craft of stonemasonry, the variety and quantity of foreign labor is most noteworthy. In keeping with a long building tradition in this country, skilled European stonemasons are given the sometimes difficult task of training and putting together crews to work in the craft.

Associations with hard and heavy work and many years of dedication shy away many would be apprentice stonemasons and training is often offered to the few who will take it, both foreigners and the less privileged eager for work.

For this reason many stonemasons have to frequently bridge difficult cultural, educational and language barriers perhaps comparable to the work by the Jesuit Priests who trained Indian sculptors to build the baroque churches of the Guarany missions in Northern Paraguay two and a half centuries before.

The paper will examine the traditional work and educational role of foreign stonemasons in various projects in the City of New York. Topics will also include on site training and the role of the Preservation Architect in formulating a coherent restoration project faced with a crew made up of diversity of cultures, educational levels and ethnic backgrounds.

The on-going restoration of the 1875 brownstone, Fifth Avenue Presbyterian Church, will be presented as a specific case study. Since August 1988 the author has been the on site Architect supervising a 26 man multinational crew of Frenchmen, Russian, Chinese and latins working in association with the stonemason training programs at the Stoneyard of the Cathedral of Saint John the Divine in New York City.

LES COMPAGNONS DU DEVOIR

Thierry Belhadj, prévôt
Les Compagnons du Devoir (Montréal)

A l'heure où chacun s'interroge sur l'insertion professionnelle des jaunes,où les jeunaa eux-mêmes s'inquiètent du chômsge croiasant,les Compsgnons du Davoir spportent une réponse toujours originale;voyage,formation en entreprise et cours complémentaires rémunération et autonomie.

La légende fait remonter l'origine du Compagnonnage à ls construction du Temple du Roi Salomon.
L'origine historique des Compagnons du Devoir se situe s l'époque dea grsnds chsntiers du Moyen-Age,lorsque s'édifiaient les csthédrales d'Europe.En ces temps où le servage était de vigueur,laur savoir-faire faisait d'eux des hommes libres,et ils se déplaçaient de chantier en chantier.
La mission des Compagnons du Devoir fut,dès lors,de former et d'accueillir les jeunes sur le Tour de Frsnce.
Dana la premiere moitié du XIe siècle,tous les métiers du Compagnonnage du Devoir créèrent l'Associstion Ouvrière des Compagnona du Devoir du Tour de Frsnce,sssocistion reconnue d'utilité publique.
La transmission du savoir aux plus jeunes,ls réalisstion du "travail de réception"-appelé souvent "chef-d'oauvre"-pour devenir Compsgnon du Devoir,l'initiation psr ls psrole et par le geste,font du Compsgnonnage du Devoir une organisation vivante prête pour l'svenir.
Aujourd'hui comme hier,de nombreux Compagnons du Devoir sont présents sur les grands chantiers,dsns les grandes réslisstions en Frsnce et dans le Monde... .
La trsdition du Voysge-le Tour de Frsnce-demeure vivante.Elle est aujourd'hui soutenue par une infrsstructure d'hébergement exceptionnelle,orgsnisée psr les Compagnons du Devoir.Cent Maisons,en Frsnce et à l'étrsnger,assurent le rayonnement géographique.Les jeunes y trouvent le contexte favorsble s ls poursuite des objectifs de qualification qu'ils se sont fixés.
La réussite aux diplômes d'Etat est encoursgée par une assis tsnce pédsgogique continue,psr un contrôle régulier des con- naisssnces et par un environnement stimulant tant sur le plan professionnel que sur le plan humain.Les Compsgnons du Devoir revendiquent ls maitrise des techniques traditionnelles des métiers hérités des siècles pssés et le savoir-fsire en mstière de restsuration.lls psrticipent activement s l'évolution des techniques de pointe,à la créstion et s ls mise su point de prototypes,s l'innovstion.
Les Compsgnons du Devoir sont reconnus comme des professionnels de haut niveau.L'exemplarité statistique de leur réussite professionnelle témoigne de la vsleur de ls formation reçue su sein du Compagnonnsge.

FUTURE PAST: INTEGRATED PRESERVATION INFORMATION SYSTEMS

Dr. C. Barrett Kennedy,
Louisiana State University School of Architecture (Bâton-Rouge La.)

PREMISE:

In view of the substantial socioeconomic benefits, why are so many irreplaceable sites and resources in peril?

The continuing loss of cultural resources in the United States is the result of a wide range of forces. The simple, enduring processes of wind and water erosion have a significant adverse impact on the integrity of individual resources, and the cataclysmic effect of events such as hurricanes, tornadoes, flooding, and seismic shock can be devastating. Mankind exacerbates the impact of these natural forces by imposing additional threats to culturally significant resources. These threats result not only from neglect and vandalism, but also from the well-intentioned but inappropriate preservation actions of uninformed administrators, designers, and tradesmen. As a consequence, the United States is losing a broad range of nonrenewable cultural resources at an alarming rate. This loss is culturally unacceptable and in violation of the spirit (and often the letter) of the federal, state, and local legislation designed to protect our cultural heritage.

A TRIPLE THREAT:

Addressing the threat of uninformed actions is essential to resolving a persistent impediment to effective preservation action. Three fundamental information management deficiencies must be remedied in order to enhance preservation processes

- the lack of a cost effective method based on contemporary technologies to acquire the information that comprehensively describes the complex character of cultural resources in their environmental context.

- the failure to gather the data generated by a plethora of preservation experiences and case studies into a rapidly accessible, fully integrated information base.

- the lack of information processing tools that can manipulate the information base to simulate management or design proposals and in doing so, provide the foundation for better informed management decisions by the designers, engineers, and resource managers who prescribe preservation treatments and formulate resource management strategies.

PROMISE:

As a mature preservation movement has come to accommodate a variety of philosophical perspectives, so too must preservation efforts embrace a variety of emerging information management technologies. The development of more effective mechanisms for informing the decision processes will enable the preservation community to strengthen its social, economic, and political advocacy for the conservation of our delicate, yet enduring, cultural roots. This paper presents prototype information management applications that demonstrate alternatives for technology transfer, adaptation, and application which can facilitate better informed decisions about the preservation of an increasingly threatened cultural heritage. The effective management of the preservation information stream will enhance the ability of all participants in the preservation processes to meet their objectives for protecting cultural resources. The appropriate use of emerging information management technologies will provide the mechanisms that will facilitate the flow of this preservation information stream.

THE USE OF MICROCOMPUTERS AT THE CENTER FOR HISTORIC PRESERVATION

Edward A. Johnson,
Center for Historic Preservation, Middle Tennessee State University (Murfreesboro Tn.)

Preservationists have not yet taken full advantage of the latest information management technology, but this is hardly surprising given the complex nature of the work. First there is the need to identify which preservation-related tasks can be addressed effectively by computerization. Then the appropriate software and hardware must be adapted or developed for the selected preservation tasks. To facilitate communication throughout the preservation community, standards must be agreed upon (particularly with respect to database structures) and various levels of networking established. Finally, mountains of preservation data must be entered into these computerized systems and made accessible to a great variety of users.

Obviously, such ambitious undertakings cannot be completed quickly. However, in spite of the incomplete state of these developments, the introduction of effective commercially-developed software running on powerful microcomputers makes it possible to successfully automate many information-related functions without extensive formal training and programming ability. The author manages such user-oriented computer operations at the Center for Historic Preservation (his other responsibilities include technical preservation methodologies and the history of building technology).

The Center produces numerous preservation-related documents, such as Historic Structures Reports, which may run to several hundred pages and include a variety of technical information. This heavily automated process uses IBM-compatible microcomputers for word processing and page layout work, with high quality output via laser printer. The reports include floorplans and site maps which are produced using computer-aided-design (CAD) software.

The Center manages several preservation-related data bases. The Tennessee Century Farms data base includes an inventory of Tennessee farms owned by the same family for at least 100 years. Catalogs to the Center's architectural slide collection and preservation research library are maintained as automated data bases. A major upcoming project will be the development of an automated expert system which can be used to date architectural materials in the Mid-South region of the United States.

Since all this computer activity is conducted by the Center's staff and student assistants - whose specialty is preservation rather than computer science - specific attention is given to maintaining a user-oriented computer environment. A menu-driven DOS shell and on-line tutorials for applications software simplify interaction with the computer for users with modest computer skills.

The in-house information management activities described above don't address the difficult long-term challenge of developing a realistic method of sharing the profusion of preservation data, of getting appropriate information to the planners who need to make informed decisions. This will require the cooperation of many members of the preservation community.

INTEGRATING AND AUTOMATING CONSERVATION TECHNOLOGY

Byron Johnson, Senior Conservation Maintenance Officer
Heritage Conservation Program, Public Works Canada (Hull Qué.)

In the rapidly automating world for design and construction, specialists in architectural conservation can often feel that they are being left behind; however, in the area of product selection there are possibilities to use computers to improve both the efficiency and effectiveness of professional decisions. The National Parks Service (US), the Conservation Information Network and the Architectural and Engineering Services for the Canadian Parks Service have all made preliminary steps to give decision makers rapid access to up-to-date information on special conservation products. This paper details these attempts and outlines hov integrated information systems will in the future be able to aid conservationists of various disciplines.

One of the on-going concerns of conservationists is the issue of lack of information pertaining to actual product use. Both the MCIN portion of the Conservation Information Netvorks system and the Conservation Product Database proposed for Parks Canada can record information on product use. This will enable product selection to be done with regard to actual use and not just the assertions of product suppliers. Both these systems also relate products to relevant ASTM or CSA standards. The Historic Structures Preservation Database of the National Parks Service has shovn the importance of conservationists having on-line access to information. These and other characteristics of integrated information systems are described in the the paper.

The author of this paper has for the past two years directed the inclusion of conservation specifications into the Canadian National Master Specification system. These master specifications are, like their US counterpart, widely used in construction. Through the inclusion of these specifications, product indexes, some of which are computerized, are nov picking up conservation products, thereby alloving designers and contractors rapid access to information pertaining to specialized conservation products. Furthermore, at least one of these indexing services ties products to ASTM and CSA standards which when combined with the work of the ASTM sub-committees on preservation, will allow rapid checking for product acceptance.

Private clubs in New York City built at the turn of the century face extraordinary obstacles to prevent their extinction. In order to remain as attractive headquarters for their membership, they must comply with current life safety and code requirements; and in order to remain financially viable, and provide future income for capital repairs and maintenance, they must upgrade and adjust their operations to permit subtle changes of use within the building itself.

The New York Yacht Club is one such club that has been able to plan for its future. Housed in one of New York City's finest Beaux Arts buildings, the Club House was designed by Warren and Wetmore for J.P. Morgan, one of the founders of the club, and completed in 1899. In 1985, Beyer Blinder Belle was commissioned to prepare a Master Plan for a phased preservation project that would include the restoration of the major public rooms, returning them to their original appearance, and provide for complete replacement of all mechanical and life safety systems. The most complex aspect of this particular restoration project has been the installation of the replacement systems. As with many historic structures, there are limitations as to where the systems can be positioned so that they do not radically alter or change the appearance of internal spaces.

The most recently completed component of the Master Plan was to provide air conditioning to the club's most important exhibit space, the Model Room, and to upgrade its life safety systems to permit public assembly. This room is ornate and richly decorated with a carved wood balcony and double height carved stone fireplace. At the center of the coffered ceiling is a 22'-0" x 28'-0" stained glass panel protected by an outer skylight. Half hull sailboat models cover the walls, and stationary exhibit cases display models of all of the runner-up contenders for the coveted America's cup.

Case studies of two interventions in the Model Room will be presented: incorporation of a mechanical cooling system in the restoration of the stained glass ceiling, and the insertion of a secondary egress. Both interventions might have been rejected on the basis of code requirements as a design solution for new construction; but existing conditions permitted relaxation of the interpretation of code requirements to allow the skylight to remain and to permit a "hidden" permanent second egress by way of a electro-mechanical, disappearing stair.

USING NEW TECHNOLOGIES TO OVERCOME CODE CONSTRAINTS

Pages Ayres Cowley
Beyer Blinder Belle Architects (New York NY)

Due to the extensive deterioration of roof above the Model Room, replacement of the entire roof assembly and skylight above the stained glass ceiling became necessary. Removal of the stained glass ceiling and replacement of the outer skylight provided an opportunity to retrofit a new heating and cooling system within "found space" at the perimeter of the floor cavity between the stained glass and the new glass skylight above. The restoration of the stained glass had to be executed swiftly with minimal disruption to the Club so that it could remain in full operation; the new roof and skylight restoration was completed in six months.

The most important aspect of the stair is that it be concealed when the Model Room is not used for more than 75 people, thereby permitting the room to maintain its original appearance. When more than 75 persons use the space, a Public Assembly permit becomes a requirement and the second egress is "activated". The staircase is currently work in progress.

The following is an outline of the presentation, which will define the scope of work and demonstrate the incorporation of new technologies to achieve code compliance.

Skylight

1. Presentation of skylight modification to provide "hooked" supports within the lead cames.
2. Integration of air conditioning louvers at the perimeter of the frame support.
3. Vibration and thermal isolation of new skylight frame.
4. Low "E" coated glass installation in protective outer skylight reconstruction to comply with energy conservation requirements.
5. High tech lighting to simulate daylight for night time functions.

Staircase

1. Electromechanically operated "disappearing" stairs and hatch covering.
2. Inclusion of emergency lighting in historic fixtures.
3. Upgrade of existing code deficient door and stairwells.
4. Early warning fire detection systems.

THE INSTALLATION OF MODERN MECHANICAL SYSTEMS

John G. Waite
Mesick Cohen Waite Architects (Albany NY)

The installation of new mechanical systems -- HVAC, electrical, and fire detection/suppression - often seriously threatens the historic integrity of a building. In order to accommodate modern uses, systems that meet contemporary amenity standards and building codes need to be provided. Often their installation is at the expense of fragile historic building fabric, which is sacrified for systems that have a life expectancy of only a generation before they in turn require replacement. In addition, the equipment for these systems can constitute a hazard to historic buildings. Malfunctioning heating equipment has damaged or destroyed countless buildings.

In order to avoid the continual mutilation of historic buildings through the renewal of utility systems, new approaches are required. This paper will review two recently completed restoration projects - Homewood House in Baltimore, MD and the Ontario County Court House in Canandaigua, NY.

Homewood was built between 1800 and 1806. Located at the center of The Johns Hopkins University campus, the house was restored as a museum in 1986-87. As part of the work, a new temperature and humidity control system was installed with all mechanical equipment located in an underground vault 150 feet from the building. Ducts were installed in utility areas disturbed by previous restoration efforts.

The Ontario County Court House, built in 1857 and enlarged in 1908, was restored for continued use as a judicial facility in 1986-88. The new heating and air conditioning system (the building had not been previously air conditioned) were installed using existing chases in the masonry, which connected with inconspicuous slot diffusers in major public spaces. Compact equipment was installed in mechanical rooms that were created from previously unfinished spaces. This system provides the level of amenity required for a modern court facility without intruding on the historic fabric of the building.

WEATHERING OF BARE AND TREATED LIMESTONES

Greet Vleugels and René Van Grieken
University of Antwerp, U.I.A. (Antwerpen, Belgique)

The sandy limestones of Balegem and Gohertange are historically very important natural huilding stonas in Belgium. Nowadays restorations are done with limestones from Massangis, France.

A network of micro-catchment units (standard devices in tha CEC-project for exposing slahs of stone), exposing these stonas to amhient atmospharic conditions, has heen set up to compare their weatharing characteristics and to gain insight into the exact deterioration mechanism. In addition to bare stones, Massangis stona specimens treated witb two available commercial protecting materials are exposed and studied. The ovarflow rainwater is collectad once a week and analysed. Blank deposition samples are collected from roughened glass plates.

To stndy the damages and changes of the stone surface due to effects of dry deposition, 15 pieces of each untreated stone type ara exposed to the atmosphere protected from rainfall and every 6 months, 3 piaces are carried to tha laboratory. The damage to the stone surface due to affects of total deposition is studied hy exposing the stone to wet and dry deposition. To study the alteration of the outer surface of stones treatad with a water repellent, 15 pieces of protected stones from Massangis are exposad in an idantical way as the bare stones and also every 6 months, 3 piaces are carried to the laboratory to assess the performance of these protecting materials.

These micro-catchment units and stone pieces are placed at 5 sites throughout Belgium with very different pollution, atmospheric and meteorologic conditions (which are monitored) and different distanca to the sea.

The soluhla fraction of the runoff watar is analysed for major ions hy ion chromatography, atomic absorption and flame emission spectrometry. The particlas in suspension are quantitatively analysed by energy-dispersive X-ray fluorescence analysis, whereas individual particles are studied hy electron probe X-ray micro-analysis. The attachment of the protection product to the stone and weatharing of tha agent will be assessed hy photo-acoustic fourrier transform infrared analysis, electron microprohe analysis and petrography.

Partly based on these runoff water and stone surface analyses, rates of material loss and quantitative reaction mechanisms are studied for the original building stones, for stones used in restoration works and for stones, treated with a water repellent.

Results pertain to the relative durahility of different limestone types, to the efficiency of the water repellents, and to the correlation hetween the rata of stone material loss, the concentration of acid gases in the air, the anvironmental condition and the composition of rainwater.

LA PRESERVATION DES MEGALITHES DU SUD DE LA BRETAGNE

Daniel Lefèvre, Architecte en Chef des Monuments Historiques (Paris, France)

Depuis quelques années le Ministère de la Culture Français met l'accent sur la protection et la présentation des grands sites archéologiqus et notamment des sites mégalithiques du Sud de la Bretagne.
Nous évoquons ici les cas de 4 monuments réputés ayant tous subi des dégradations importantes au cours du temps: la Table des Marchand, le caïrn de Gavrinis, les alignements de Carnac et le caïrn du petit Mont.
Ces monuments de nature différente ont traversé plusieurs millénaires et présentent des altérations dont les principales causes sont: l'usure du temps, les agressions de l'homme-aménageur et plus récemment celles de l'homme-touriste.
Les remèdes à l'étude actuellement doivent aborder des domaines aussi différents que l'urbanisme, le climat, la géologie, la chimie, l'architecture, l'économie...

. La Table des Marchand est un grand dolmen construit originellement au cœur d'un tumulus. Pillé dès l'époque gallo-romaine , il a été depuis un siècle, dégagé puis remblayé et en ce moment fait à nouveau l'objet de fouilles archéologiques qui nous révèlent son histoire et son rapport avec le grand menhir qui le jouxte et le grand tumulus d'Er Grah.

Des études sont actuellement menées à trois niveaux.
. l'altération des parements des grandes pierres qui se desquament entrainant d'une manière irreversible la destruction de gravures faites par les hommes il y a plus de 5000 ans.
Les produits de consolidation à mettre en œuvre nécessitent des études de vieillissement et de reversibilité, aucun produit consolidant ne sera employé sans s'être assuré qu'il ne risque d'entrainer des effets secondaires néfastes et que tous les traitements soient réversibles aisèment.
. la consolidation et la présentation des structures du caïrn font l'objet d'études préalables en cours, les solutions proposées vont du simple remblaiement des fouilles à la présentation à l'intérieur d'un bâtiment de protection.
Le projet définitif ne pourra être décidé qu'à l'achèvement des fouilles en cours qui remettent constamment en cause les propositions de présentation.
Outre les problèmes de climat ambiant des gravures, il s'agira de définir l'image future du monument (éclaté, restitution...)
. L'accueil du public de plus en plus nombreux posant d'importants problèmes d'érosion; des études d'aménagement du site sont actuellement lancées.

Le schéma décrit ci-avant pour la Table des Marchand est sensiblement le même pour les autres monuments avec cependant le traitement de leur particularité.

. Faut-il notamment construire un fac-similé de la chambre funéraire superbement gravée, du dolmen de Gavrinis au risque de voir s'effacer sous le choc des sacs et appareils photos une des plus belles œuvre de sculpture.
Fuat-il détruire ou aménager le blockhaus construit lors de la seconde guerre mondiale au centre d'un des plus beaux tumulus qu'est le caïrn du petit Mont..

. Pourra t'on modifier l'organisation urbaine des villes balnéaires de Carnac, Quiberon, Locmariaquer, pour sauver de la dégradation accélérée des célèbres alignements de menhirs de Carnac?

Notre société contemporaine agressive à l'égard de ces traces fondamentales pour la connaissance de l'histoire de l'humanité est en même temps capable de mettre en œuvre les techniques les plus sophistiquées de leur préservation. Les solutions proposées essaient de résoudre ces contradictions, mais d'autres choix seront à faire dans certains cas, tels la fermeture définitive de certains de ces sites.

PRESERVING INDUSTRIAL STRUCTURES IN HARSH ENVIRONMENT

Edward A. Johnson
Center for Historic Preservation, Middle Tennessee State University (Murfreesboro Tn.)

Preserving historic buildings and structures requires the preservationist to cope with exposure to weathering and biological attack. In the case of industrial structures, these difficulties are exacerbated by exposure to harsh chemical environments and mechanical wear. When conducted in a museum setting, such preservation efforts must also conform to the somewhat stricter rules of museological conservation. As suggested in the following case study, the practical implementation of conventional preservation and museological standards with respect to industrial structures can be extremely difficult. Should a different set of standards be developed for the preservation of industrial machinery and structures? By extension, should other sets of standards be developed to reflect various kinds of heritage-related resources?

The author served as Curator of the Arkansas Oil and Brine Museum from 1983 to 1988, where he used the methods discussed here to preserve oil production machinery and structures from the southern Arkansas oil booms of the early twentieth century. The author continues working on the problems of preserving technological artifacts at his current employer, the Center for Historic Preservation, where he also manages preservation-related computer operations.

Oil rigs of the 1920s were constructed of large wooden timbers and ferrous metal fittings. While metal fittings often survived, wooden elements usually disappeared, victims of biological infestations, exacerbated by the practice of placing sills directly on the ground. The museum reconstructed the rigs using original metal fittings and replacement wooden members. The reconstructed rigs, like their historic predecessors, are exposed to a severe environment, requiring wood preservation techniques. The rigs were installed on hidden concrete foundations. Wood preservatives were applied to increase resistance to insect and fungal attack.

Later oil rigs were constructed of rolled steel and iron castings. Ferrous metals are subject to corrosion, a process exacerbated by the brine (salt water) which emerges from the earth along with the oil. Derricks were dismantled and derusted by acid pickling. Wire brushing was used to clean minimally corroded machines, but proved inadequate in removing heavy corrosion products in pitted surfaces. With much trepidation, we resorted to sand blasting to remove corrosion from deeply pitted surfaces of massive machines, although this practice clearly violated established preservation and museological recommendations.

After the ferrous surface was stabilized, an appropriate coating was applied. Machinery was protected with paint, effective and reversible, but requiring reapplication every few years. Metal derricks were regalvanized to provide a coating of substantially longer lifespan.

Villamayor sandstone is a building material where the main components (quartz and feldespars) are soldered by layer silicates (smectite, mica and kaolinite), and fibrous silicates (palygorskite). It has been used in Salamanca (Spain) since Roman ages through differents architectonic styles. There are interesting (Roman, Romanic, Gothic, Plateresc, Neoclasic and Modern) monuments built with it.

Because of the high porosity of this material, the humidity is the first degradation cause. When affected by humidity, in evaporation area, a salt precipitation happens in subsurfacial areas of stones, producing a high degree of degradation.

However, in "Casa Lis", a building from the begining of the 20^{th} century, the formation of a hard crust, outside the stone wall, in the low part of an facade, can be observed. The interest of this crust is that, after its formation, the stone became stabilized, and no formation of powder or slabs is observed. The stone seems to be preserved by the presence of the crust.

Conventional tecniques (XRD, DTA-TG, IR and Chemical Analysis) have been employed to determine the nature and formation processes of the crust, and the organic material found between the crust and the sandstone has been characterized.

PRESERVATION PAR FORMATION D'ENCROUTEMENTS NATURELS: LE "CASA LIS", SUJET D'ETUDE. (Preservation through the Formation of a Natural Surface Covering)

L.A. Ortega & V. Rives
Departamento de Quìmica Inorganìca, Universidad de Salamanca (Salamanca, España)
Dr. Marìa-Angeles Vincente, IRNA/CSIC (Salamanca, España)

La "Arenisca de Villamayor" est un grés argileux, donc les particules grosieres (quartz et feldspth) sont unies par un ciment formé par de phyllosilicates (esmectite, micas et caolinite) et silicates fibreux (paligorskite). Cette pierre a été employé à Salamanca dès l'époque Romaine jusqu'a maintenant. Dans la ville de Salamanca il y a de nombreux monuments en "Arenisca de Villamayor" des different siecles et styles architectoniques: Romain, Roman, Gothique, Plateresque, Barroque, Neoclasique, Moderniste etc.

Le Grès de Villamayor est un material très poreux dont la principal cause de degradation est l'eau. Les cicles d'humectatión - dessication produissent des phénomènes de gonflement-retrait des argiles gonflantes et, dans les zones d'évaporation de l'eau, precipitation des sels.

La precipitatión des sels a lieu, d'habitude, dans la zone sub-superficelle en produissant une forte degradation. Par contre, à la "Casa Lis", une maison construitte au debut du 20^{em} siècle, on peut aprecier un dure croûte formé à l'exterior de la pierre dans la partie inferieur d'une de ses façades. L'originalité de cette croûte c'est le fait, qu'elle semble proteger la pierre contre la degradatión. En fait, sous la même, le grès ne présente aucune signe d'alteration.

La nature, causes et processus qu'ont lieu pendant la formatión de cet encroûtement on été etudies en employant les methodes conventionnels: XRD, DTATG, IR et Analyses Chimiques. Les êtres vivants (algues et champignons) qu'apparessent entre la pierre et la croûte ont été de même caractérisés.

A PROGRAM FOR MONITORING, TESTING AND EVALUATING THE SARATOGA MONUMENT, SCHUYERVILLE NY

David Bittermann,
US National Parks Service (Boston Mass.)
Clay Palazzo, Project Architect
Mesick Cohen Waite Architects (Albany NY)

The Saratoga Monument, a 150 foot tall obelisk, was constructed to commemorate the 1777 Revolutionary War battles at Saratoga. This series of battles represented a turning point in the war; the British General John Burgoyne, attempting to assert control over the Hudson River, was thwarted by the Americans as he moved toward Albany. On October 17, 1777, following 29 days of fighting, Burgoyne surrendered his forces to the American general Horatio Gates at Saratoga (now Schuylerville).

As the centennial of American independence approached, a great interest developed in commemorating American history. In 1859 the Saratoga Monument Association was organized under a perpetual charter from the State of New York. The objective of the association was "the erection of a fitting memorial on the site of Burgoyne's surrender." Over a period of twenty years, from 1877 to 1897, the Saratoga Monument was constructed and fitted with statuary and commemorative plaques.

The monument stands as a marker in the landscape and provides an observation platform for surveying the countryside where the battles took place. It is constructed of rock-faced New London granite. The interior walls at the base of the monument are lined with polished granite and bronze tablets. The bronze bas-relief tablets represent historical and allegorical scenes connected with the closing period of the American Revolution. Intermediate stair platforms are supported by brick vaulting and steel beams. The platforms are interconnected with cast-iron stairs, and they are paved with plain and patterned tile. Ornamental terra cotta tiles have also been used on the wall surfaces within the monument. Three bronze statues of the American generals occupy the exterior niches, and double brass doors have been hung on each of the monument's exterior faces.

In 1895 the Saratoga Monument Association turned the structure over to the State of New York which administered the site until 1980, when control of the monument was released to the National Park Service. Having gradually fallen into disrepair over the years, and having suffered from several modifications, the monument was closed to the public in the 1980s.

Currently, the monument is undergoing a program of monitoring, testing and evaluation for a period of one year. Structural conditions are being examined through the use of a foundation test pit, soil borings, photogrammetric plots and interior masonry probes. The exterior of the structure will be fully scaffolded and visually examined. Salt migrations and rainwater runoff patterns will be mapped, and mortar analysis will be undertaken. On the interior, crack gauges are being used to gauge movement, and hygrothermographs are being utilized to follow air temperatures and humidity levels. Interior surface temperatures of the granite walls are also being recorded. Quantitative environmental data from the interior of the monument is critical since no HVAC system currently exists. Each of the various architectural materials, including the stonework, metalwork, tile, glass and coatings are being analyzed through visual inspection and laboratory analysis.

At the conclusion of the testing and monitoring phase correlations will be made between the differing bodies of data. For presentation purposes the intent will be to outline a thorough program of evaluation and to show the advantages of combining collected data in various ways to provide a complete understanding of a structure's condition and stabilization needs.

HISTORIC DETAILS, MIRACLE CURES AND THE RAVAGES OF TIME: JACKSON PLACE TOWNHOUSES, WASHINGTON DC

David E. Kemnitzer, AIA
Einhorn Yaffee Prescott, Architects & Engineers, P.C.
(Washington DC)

BACKGROUND

The Jackson Place Townhouses are a block long collection of houses facing Lafayette Square, in Washington D.C. The ten houses included in the project extend from the historic Blair-Lee House (now the President's Guest House) on the south end, to the Stephen Decatur House (owned by the National Trust for Historic Preservation) on the north end. Six of the twelve townhouses were built between 1858 and 1870. The other four were built in the mid-1960's.

The historic townhouses are either brick with extensive brownstone trim or all brownstone with elaborately carved trim. The newer townhouses are primarily brick with cast stone and concrete lintels and cornices.

ABSTRACT OF PAPER

The presentation will deal with the differences in weathering between the historic details and those used in the mid-1960's construction - the historic construction weathering much better. The various miracle cures and quick fixes used over the years will be discussed. These include epoxy coatings over brownstone, cellulose patching materials (Dekosit), stucco and cementitious patches. These have weathered in differing manners and have affected long term deterioration in different ways. Removal and treatment of these previous interventions will be discussed. The project also includes replacement of many original brownstones, including those with elaborate carving. The presentation will deal with the conditions and philosophical considerations which led to this decision and with the methods used to faithfully reproduce the original carving.

HISTORIC USES OF ASBESTOS IN BUILDINGS

John W. Snyder, P.S. Preservation Services (Sacramento Ca.)

Asbestos! Known and used in antiquity, this mineral was "rediscovered" in the 19th century, and fully developed for use in a wide variety of products in the 20th century, including many connected with the building trades. Hailed as a miracle product sure to revolutionize building, asbestos supported a multimillion-dollar-a-year industry. But when its health consequences became known, asbestos became instead the basis of a multimillion dollar lawsuit. Today, abatement of asbestos in buildings is the latest multimillion-dollar-a-year industry fostered by this one-time wondrous mineral.

The health hazards of friable asbestos are well known and well publicized. They are certainly of concern to preservationists, who must count themselves high on the list of those likely to encounter the material. But how widespread is it? How early was it used? How and where and in what building products was it used? When did these products come into use? Which products present the greatest hazards, and when?

This paper will report work in progress which is examining the historic uses of asbestos in buildings, concentrating on the 19th and early 20th centuries. It will discuss the material itself, its principal sources and production methods, and will concentrate on its various applications in buildings during this period. While the asbestos products in use from the 1930s through the 1970s are well-documented, the earlier materials are less well known. The paper will cover such products and uses as asbestos roofing (ca. 1868), asbestos paint (1874), asbestos insulation and lagging (ca. 1875), asbestos plaster (ca.1895), asbestos shingles (ca.1905), asbestos vermin-proofing (ca.1910), asbestos boarding (1912), etc., and will communicate the relative hazard posed by each.

It is clear from this research that asbestos in buildings is much more widespread than is generally known by practitioners of historic preservation, and that its use is much earlier than is customarily recognized. The dissemination of this information to--and through--APT is critical to increasing such awareness and allowing appropriate protective measures to be implemented.

ASBESTOS II, THE CHALLENGE CONTINUES

Richard S. Beardmore, Instructor and Research Associate
Colorado State University, Office of Research, Development & Training, and Construction Management Program (Fort Collins Co.)

AT THE 1989 APT CONFERENCE, MR. BEARDMORE PRESENTED A PRIMER IN THE AREA OF HISTORIC ASBESTOS CONTAINING BUILDING MATERIALS (ACBM) AND THE ASSOCIATED RISK OF PRESERVING AND/OR CONSERVING THESE MATERIALS. BUILDING ON THIS INTRODUCTION, THE EVER INCREASING NEGATIVE IMPACT OF CURRENT HISTORIC ACBM ABATEMENT PRACTICES ON PRESERVATION FEASIBILITY WILL BE PRESENTED FOR CONSIDERATION.THUS CONFEREES MAY ADD TO THEIR PRESENT UNDERSTANDING OF HISTORIC ACBM BY EXPANDING THEIR KNOWLEDGE OF THE PRESERVATIONIST'S ROLE AND RESPONSIBILITY IN GUARDING AGAINST THE FREQUENT WHOLESALE REMOVAL OF HISTORIC FABRIC. THOUGHTFUL INTERVENTION OF HISTORIC ACBM, RATHER THAN ABATEMENT, WILL BE DISCUSSED ALONG WITH OTHER AVAILABLE OPTIONS SUCH AS SAFE INPLACE MAINTENANCE OF HISTORIC ACBM. ALSO, CURRENT TRENDS AND PHILOSOPHIES ESPOUSED BY THE VARIOUS PLAYERS IN ASBESTOS ABATEMENT WILL BE PRESENTED THUS REVEALING HOW THESE ISSUES AND RELATED ASPECTS ARE KEENLY RELEVANT TO... PRESERVING FOR THE 21st. CENTURY!

In 1989, the asbestos removal industry grew to become a $5 billion business. And nothing but continued growth is projected for the industry in 1990 with $7.5 billion in business easily attainable by year's end. This tremendous economic momentum, combined with high public visibility, legal liability and political inertia, continues to jeopardize hundreds of existing historic properties and potential preservation candidates. The challenge continues!

Preservation of many historic and potentially historic interiors, and even some exteriors, has been profoundly preempted due to the commonly accepted asbestos abatement practice of total material removal. This option, which is deemed to be the "safest method" for a variety of reasons, is consistently recommended rather than selecting one of the other acceptable less costly options such as encapsulation, preventative maintenance, worker/employee education and surveillance, ACBM condition and air quality monitoring, and in-situ ACBM conservation.

Since the production and incorporation of ACBM in institutional, governmental, commercial, and educational buildings sky-rocketed after WWII and continued well into the 1960's, preserving contemporary historic structures in the 21st century will undoubtedly require critical asbestos abatement decisions, informed evaluation of the actual health hazards, innovative intervention, risk management, and risk taking ..... none of which are new to preservation.

In society as a whole and in construction/preservation in particular, there exists an evolutionary cycle or process which operates slowly, but inevitably. A particular practice, once thought of as acceptable, is discovered to have undesireable by-products or after-effects. A flag of alarm is raised, but the practice continues with little pause. As time passes, additional studies and findings are published. Slowly the practice begins to wane, but it continues so long as commercial entities find it profitable to manufacture, promote, and sell the instruments of such practice.

In the 1950's and 60's, smoking, asbestos, and the use of acid for cleaning limestone were all considered acceptable practices. By the mid 70's and early 80's, it was apparent, from the study of technical literature, that all three practices had undesireable consequences which far outweighed the benefits originally ascribed to each. Each would leave a legacy of latent despair and damage to be manifested in subsequent years and decades.

By the early to mid 80's, the use of asbestos in the construction and renovation of buildings had ceased because no companies still found it profitable to continue manufacturing, promoting, and selling such products. And cigarette sales were definitely down.

Not so for the practice of cleaning limestone and other calcium carbonate materials with acidic cleaners.

Despite constructive public notice provided by the U.S. Government in its 1979 Standards for Historic Preservation Projects, and Parks Canada in Architectural Conservation Technology (page 8), the practice continued unabated into the 80's.

In ASTM's 1986 STP 935, Cleaning of Stone and Masonry, the case against the use of acid, particularly HCl, was forcefully stated, yet, even for historic structures, the practice continued.

In 1987, APT published a letter stating that calcium carbonates and other masonry should not be cleaned with any solution of less than 4.0 pH, yet the practice continued.

ACID VS ANTI-ACID: A CRITICAL EVALUATION OF CURRENT LIMESTONE CLEANING PRACTICE.

Larry D. Jones
Larry D. Jones & Associates (Houston Tx.)

A further review of scientific literature reveals that virtually every credible authority, who has addressed the issues, cautions against acid for limestone and the use of HCl (muriatic) acid for any masonry cleaning. Yet the practice continues to this day.

A 1988 review of documentation prepared by the U.S. National Park Service reveals that many acidic products are still being manufactured for the stated purpose of cleaning limestone, marble, and other calcium carbonates.

A comparison of Material Safety Data Sheets and commercial product labels indicates that "blended acids" is often a euphimism for HCl (muriatic) acid.

Clearly a confusing picture emerges for the architect, specwriter, and preservation specialist who deals with questions of masonry cleaning only infrequently. While the term "muriatic acid" does carry a certain stigma, the fact that muriatic acid and HCl acid are one and the same is apparently not well understood.

Preservation technology is advanced both by means of addition and subtraction. Addition by the development of new techniques. Subtraction by discarding old, failed technologies. Who better than APT to take the lead in eradicating this archaic practice.

The presentation can be adjusted to fit any time frame between 20 and 30 minutes. A double screen slide set-up can be effectively utilized, if available.

"DESIGN CAST" AS TERRA-COTTA SUBSTITUTE

Christopher Tavener, AIA
The Stein Partnership (New York NY)

The Stein Partnership was asked to find a replacement for some twelve thousand failing terra cotta units on a landmarked building on the campus of the City College of the City University of New York. As a public authority, the City University needed a solution both durable and easy to maintain; they also wanted a project that would be acceptable to the City and State Landmarks authorities. The presentation will describe how the overall problem was approached, how materials were tested, chosen and detailed, and will review problems faced by an architect in drawing up contract documents and providing architectural services during fabrication and installation for new materials and unconventional means of construction.

TERRA-COTTA RESTORATION 10 YEARS LATER: BOTH SUCCESS AND FAILURE

Roger E. Galliher,
Galliher and Baier Architects and Planners (Simsbury, Conn.)

The George Walter Vincent Smith Art Museum in Springfield, Massachusetts is listed on the Historic Register and is one of the select buildings in the Commonwealth to be included in the State Building Code as a "totally preserved historic building". The 40,000 SF, two story structure designed by Renwick, Aspinwall and Renwick, Architects, was built in 1892 to house a private art collection. An addition was added in 1922. It is a magnificent classic Italianate edifice of Roman brick and elaborate terra cotta.

Earlier maintenance efforts were misguided and detrimental - copper boots on terra cotta balusters, incorrect sealants, cement mortar, bituminous caulking, etc. These, coupled with deteriorated parapet flashing, caused extensive leaking that could no longer be ignored.

Although our office had been in practice for some time, the museum was our first restoration work on a historic building. I was not aware of APT and similar sources of preservation information. But, we wanted to do a good job and background input was obtained from many sources. Of course the information was incomplete and conflicting. We took photos, studied old terra cotta literature and did our best to define the scope of necessary work. We had a lot to learn and it was a slow process.

Document preparation lasted six months. The final specs called for "repair of deteriorated terra cotta and replacement with new terra cotta if unit can not be restored". An alternate for precast concrete units was included. Wow!

The bids varied 100%. Thankfully, the low bidder was a museum member and reputable contractor. Once scaffolding was up, the condition of each terra cotta unit was sketched. To save time and money, precast units were selected as replacement for non-restorable terra cotta. Careful demolition started and every effort was made to salvage every possible terra cotta unit. We discovered 1890 terra cotta was superior to 1922 units.

An experienced precaster assisted with numerous samples and tests. Approximately 1200 terra cotta units were removed and 500 replacement units were precast. A "restoration factory" was located on the roof. Stainless steel rods, epoxy, rubber bands, coating material, brushes, and all sorts of paraphernalia were everywhere. Restored terra cotta and precast units were reinstalled in a better than original manner. Terra cotta was cleaned as restored and later the entire facade was cleaned. Special attention was given to the new flashing.

Within two years, there were problems and we returned to the scene. Caulking had turned to pancake batter. Green stains and efflorescence appeared. More consultants, contractors and testing. Poor conditions were corrected. Continued evaluation and a current thorough inspection has indicated more errors, but also what has worked and is doing well.

Approximately 40 slides of original conditions, specified details, restoration work in progress, final results and current conditions will be presented.

PLACE DES ARTS: BUILDING THE CONTEMPORARY LANDMARK

David J. Wigglesworth, Architect
Dimakopoulos & Partners, Architects (Montréal)

Over twenty five years ago, Place des Arts was conceived as the new major centre for the performing arts in Montreal.

It was always intended that Salle Wilfrid Pelletier would become established, as the focal project within a Place des Arts Complex. In fact it stood alone as the only project for Place des Arts until the Maisonneuve and Port Royal Theatres were built for Expo '67. Since that time the site has remained incomplete and largely dominated by endless asphalt paving surroundlng Salle Wilfrid Pelletier and temporary landscaping at a lower level, adjacent to Ste-Catherine Street.

Within the site, the 3000 seat Salle Wilfrid Pelletier is now being renovated and, on the west side of Place des Arts, the new Museum of Contemporary Art is under construction. The final component to be incorporated into the complex will be the new home of Quebec Conservatory of Music and Drama.

The specific functions and design of the original buildings which make up the complex no longer conform to the original 1963 master plan. The challenge to the architects has therefore been to conceive a project which respects the individuality of the cultural institutions which will make up the new Place des Arts, create a cohesive reorganization of public areas within the complex (both internal and external), and to acheive a completed cultural centre within the spirit of its original conception.

SEALS, SEALANTS AND CAULK - PRESERVATION CHALLENGES FOR THE NEXT CENTURY

Michael Johannes Paul
Gredell & Paul (Wilmington De.)

Construction sealants have undergone a revolution since the 1950s, with dramatic increases in strength, durability, resilience, and adhesion. Advances in sealant technology and application have been spurred by, have prompted, or have occurred alongside other construction developments, some of which have had profound effects on contemporary construction:

Structures are lighter and more flexible.

Unusual structural forms and geometries place new demands on walls and roofs and their sealants.

Exterior walls are usually nonstructural curtain wall systems, which are thin and flexible.

Thinner curtain walls, with only nominal back-up barriers, demand tighter primary seals.

Exterior wall materials are stronger and, often, more brittle.

Traditional wall and roof materials are used in innovative ways. New wall and roof materials are developed and applied.

Wall systems are increasingly fabricated in the shop to minimize site work and maximize quality.

What are the consequences of these sealant-related construction trends for 21st century preservation of our contemporary buildings, bridges, monuments, and other structures? What challenges will we face as we try to repair, modify, or replace on-site seals that originally relied upon high-quality manufacture and fabrication in the factory and shop? How pervasive will be deterioration and failures caused by improper or inadequate on-site installation and maintenance of "high tech" sealants? How will we conserve historically significant curtain walls that experience chronic sealant failure from material or functional incompatibilities among components of the wall system or between the system and the structure? What effects can we expect to see from chronic failures of primary seals?

By exploring the history of construction sealants, their contemporary uses and problems, and emerging trends, we can prepare, at least in discourse, for the challenges that we will face in the next generation as we will preserve what we are now building. Perhaps through this discourse we also can learn how to make contemporary building more durable.

BORATE PRESERVATIVE TREATMENTS FOR HISTORIC WOOD STRUCTURES

Thomas D. Visser, Research Assistant Professor
Historic Preservation Program, University of Vermont
(Burlington Vt.)

Recent experimental applications of water soluble, borate-based preservatives to wet and green wood show promising results against the spread of decay and insect damage with relatively low human toxicity levels. This paper explores the applicability of borate treatments for the preservation of historic wooden agricultural buildings.

The tests were conducted on a heavily deteriorated, late18th century, slaughterhouse located at Rokeby Museum in Ferrisburg, Vermont. Both wet, partially-decayed historic timbers and freshly-sawn replacement lumber were treated on-site by immersion in a specially fabricated steel trough filled with a hot borate solution. The wood was then deadpacked and left covered for several days to allow diffusion by chemical osmosis. Penetration was gauged by colorimetric tests. Large historic framing members were treated in situ. The work was performed in subfreezing weather.

The results of the study indicate that the on-site application of water soluble, borate-based, wood preservatives may be a viable conservation treatment option for some heavily deteriorated wooden structures, especially historic farm buildings. By treating both existing timbers and new green replacement lumber to discourage the spread of decay, more of the structurally sound, but insect and fungi-infested wood might be retained, allowing more of the historic character of the buildings to be preserved.

Borate preservatives may also be an alternative to more hazardous organic and metallic compounds. The treatment does require special equipment and may have an impact on project schedules, however. The apparent benefits and limitations shall be reviewed in the slide presentation. Guidelines on treatment techniques and suggestions on when conditions might warrant the use of borates shall be also discussed.

EVAPORATIVE POLYSTYRENE CASTING TECHNOLOGY

J. Scott Howell, VP/ General Manager
Robinson Iron Corporation (Alexander City Al.)

The rise of evaporative polysterene metal casting technology over the past five years has been a veritable renaissance for metal casters worldwide. High volume purchasers of iron and aluminum castings have embraced the process because it provides a more consistent, dimensionally accurate product which requires less machining. Previously drilled holes and milled surfaces are now provided by the casting process itself saving the manufacturers enormous amounts of time and money.

Foundries prefer the evaporative polystyrene casting method because it reduces their labor and material costs. The process has eliminated the need for cores and chemically bonded sands which are required for traditional casting methods.

With proper gate and sprue attachments any polystyrene shape imbedded in unbonded sand can be poured with molten metal. The metal causes the polystyrene pattern to sublime allowing the metal to assume the exact shape of the pattern. Since many polystyrene patterns can be glued together before being imbedded in the sand, draft angles are no longer a major issue for the foundry. Interestingly custom carved polystyrene shapes may be cast on a one-time basis as long as the proper gating requirements are

Because the technology is relatively new to the foundry industry only very high volume users of metal castings can afford the immense tooling costs necessary for the production of the polystyrene patterns. In addition, there is a visible difference in the surface texture of traditional sand castings and castings produced with evaporative polystyrene. The challenge for metal casters is overcome the cost and appearance barriers enabling this technology to be used for other applications such as architectural and preservation casting requirements.

HERITAGE CONSERVATION DISTRICTS - DESIGN AND PRESERVATION GUIDELINES FOR THE YEAR 2000

Richard Unterman
Unterman McPhail Cuming (Toronto Ont.)

The focus of the paper is the presentation of our firm's work in the area of ***Heritage Conservation District Studies and Plans.*** *Our approach deals with the review and assessment of heritage attributes including history, architecture, landscape and a separate but important aspect involving the present planning policies of a community.*

Based on our work in both urban and rural areas we have developed an approach to the design of architectural and landscape conservation and preservation guidelines which we believe will provide the communities, residents and municipal staff with a pragmatic approach to the topics described above. Most importantly, we hope to provide guidelines which will manage the change in heritage areas to accommodate the future which may involve infill structures, additions, alterations and even demolition.

RENOVATING THE VERNACULAR BUILDINGS OF HISTORIC PENSACOLA

Dr. Diana Jarvis Godwin, Historic Preservationist
Historic Pensacola Preservation Board (Pensacola Fl.)

Vernaculsr buildings preaent a special problem for the building conaervator. Since they are not uaually built from plans, but rather based upon a folk tradition, researching them is more a matter of finding out the details of craftsmanship through the medium of history and ita methods. Photographic research is eaaential to the restoration of vernacular buildings, again the skilled researcher can often find clues that an architect is not trained to discern. For a successful renovation or restoration, a building conservator must, of course, look for clues in the structure of the building itself.

The significance of a vernacular building is not alwaya readily apparent. Their often humble attributes often lead the unachooled to undervalue them and their role in hiatoric architecture. Too often they are neglected in favor of more formal buildings generated by architects and their wealthy patrons. As in formal history, the story of the prestigious minority of a region is told without the correaponding tale of the middle and lower classes of a society. Nothing can tell thia fuller history better than a competently renovated historic vernacular building.

Most of the significant buidlings in Pensacola have links to its pioneer days, Historic Pensa cola Village contains many of the most important buildings in Pensacola, Buildings that were recognized by the community in the early years of the preservation movement in the United States. Unfortunately, many were renovated before the technology of building conservation was well-developed. Many of these buildings were moved and worked on in the 1960's. Largely due to the use of inappropriate materiala and the inferior quality of modern woods, they suffered from deterioration The introduction of air conditioning to wood houses hastened condensation problems leading to rot, fungus and insect infestations. An effort to be authentic caused problems of rot through the use of ungalvanized nails. Softer modern woods were more prone to decay and flaws. Historic Pensacola Village's efforts to renovate theae renovations, while attempting to retain the building's integrity and form are the central focus of this paper.

THE AMANA COLONIES: A GRASSROOTS EDUCATION PROGRAM IN PRESERVATION TECHNOLOGY

Ned Crankshaw
Faculty of Landscape Architecture, New York State College of Environmental Science & Forestry (Syracuse NY)

The Amana Colonies are seven villages in the Iowa River Valley of eastern Iowa, U.S.A., founded in the 1850s by the German Inspirationists who formed the Amana Society. The physical structure of the colonies and individual buildings are expressive of the communal social system that they served. In 1932, the communal system was abolished, and most property was privatized, though deed restrictions controlling land use were held by the Amana Society. In 1982, control of land use by the Amana Society was invalidated by the Iowa Supreme Court. The next year, the Amana Colonies Land Use District was formed, and historic districts were adopted which included the majority of the area of six of the seven villages. The regulations for the historic districts were broadly written and were based on the Secretary of the Interior's Standards for Rehabilitation. As problems occured from differing interpretations of the Standards, a need was recognized for more specific guidelines and information that could be used by property owners and the Historic Preservation Commission.

The Amana Colonies Design Guidelines were prepared by Jan Jennings and Herbert Gottfried of Jennings Gottfried Cheek/Preservationists as a specific manual of recommendations for property conservation to be used by owners in planning projects and by the Historic Preservation Commission in reviewing projects. The Land Use District recognized that distribution of the guidelines would not guarantee acceptance of the recommendations. Two major accompanying tasks were to provide technical assistance and education to property owners and, eventually, to provide financial assistance for preservation.

Provision of financial assistance beyond that which is available from federal and state government has not yet been addressed, though explanation of and assistance with existing programs is a part of the Preservation Education Program.

The Amana Colonies Preservation Education Program was developed by the Amana Colonies Land Use District and Ned Crankshaw, project manager for Jennings Gottfried Cheek/Preservationists, as a series of community workshops, which provide a forum for hands-on experience in preservation processes and technology. The unity of the villages is their most important characteristic, yet properties are individually owned, so involving as large a part of the community as possible is critical. Targeted audiences include homeowners, business owners, local schoolchildren, and local lumberyards, building contractors, and landscape contractors. Activities include demonstration, participation, and discussion of methods and tools, group assessment of buildings and landscapes, group planning of building and landscape rehabilitation, and discussion of financial tools and implications. The program recognizes the financial and technical limits inherent in the situation, and is focusing on technology that is realistic for the community. The first series of workshops in the summer of 1990 are seen as the beginning of an ongoing activity. As well as continuing with the workshops and other informational programs, other activities being presently considered to encourage building and landscape conservation include:

- providing local economic assistance to property owners for conservation projects
- developing local production of materials and a pool of local craftspeople
- developing more specific design guidelines for landscape

In planning for the long-term stewardship of the Amana Colonies, the Land Use District is recognizing the need for local governments to go beyond review and reaction and to take an active leadership role in community preservation.

AUSTRALIAN HERITAGE LEGISLATION AND OUR UNIVERSAL HERITAGE

Scott Cunliffe
Anglin Associates (Potts Point-Sydney, Australia)

Our collective responsibility for the twenty-first century lies in the realms of education for the **protection of the universal heritage**. Our "Heritage" (not yours or mine) incorporates cultural natural and human creation, "universal" recognises the global village concept and the awareness of heritage as the basis of ones cultural identity, and finally the word "protection" because if we lose our memory, we lose our soul.

The measures available to government in Australia and particularly the state of New South Wales for the protection of the "environmental heritage" has led to Acts of Parliament ensuring this protection is afforded legal status. Is this enough and should heritage education be part of the legislation ?

The City of Sydney is a fine example to illustrate how this legislation has evolved in the last two decades, with particular reference to my work on the preparation (1989) of a schedule of some seven hundred "items of the environmental heritage of the City of Sydney", how those items were selected, public participation in the process, the role of the media, and the role of the consultant. The NSW Heritage Act and the Environmental Planning and Assessment Act are more than ten years old, they have met with both vehement opposition and support, misunderstanding and misinformation, and have failed to as yet permeate much beyond the planning profession.

Examples of these and other issues will describe the effects of our state legislation, our cautious acceptance of these 'rules', and how their application or implementation here is contributing to the protection of our universal heritage.

CHANGING PRESERVATION CONCERNS IN THE 21ST CENTURY

David Roessler, AIA
Swanke Hayden Connell Architects (New York NY)

"Prediction is very difficult, especially with regard to the future." (Anon.)

The paper will suggest some likely new concerns of Preservation in the 21st Century. First, it will attempt to indicate where some of the observable social, economic and political changes of our time are leading our profession. Second, it will look at some aspects of the built environment that seem likely to receive more attention.

First, the changes in our world and their consequences for Preservation. Politically we are experiencing a new era of greater popular accountability, a time when it is no longer possible for governments to sweep away major buildings, much less neighborhoods or even whole villages (thousands of them, as was planned in Rumania), without public discussion. In this, the first century of Preservation, most every country can point to outrageous acts of destruction, losses which are increasingly unthinkable today. That the world will be disinclined to tear down architecture that people care about is wonderful; a consequence, however, will be our professional obligation to help articulate popular concern and to exercise discrimination as to what we protect. Because there will be many more of them, we must pick our battles more carefully.

Turning to social change, just one oblique aspect will be considered and that is how adept the world has become at jerry-building and at imitating materials and architectural effects. A noteworthy backlash, for which there is already evidence, will be a much heightened interest in craft and "the real thing". Both will have positive benefits for Preservation.

In terms of economic change, the issue of public money for private Preservation will be mentioned as it affects religious buildings. Here the expectation is that public funding will be increasingly available.

Second, buildings due for more attention. It seems fair to predict that, moving along the time line, we will soon be concerned with preserving the later monuments of 20th Century Modernism such as, in New York City, Saarinen's TWA Terminal and Roche and Dinkeloos' Ford Foundation Building. To these fairly obvious developments I should add another --- a new interest in that whole body of rather low key buildings of the 60s, buildings owing much to Frank Lloyd Wright and the Pacific Northwest. As the 21st Century moves us increasingly towards the industrialized synthetic, the better buildings of the Post War decades, often simple structures of brick and timber, will be seen as small classics of 20th Century Modernism.

Introduction:

Urban churches and synagogues capture community attention by their prominence in the streetscape. They indelibly mark the neighborhood's character with their presence, and in many instances contribute forcefully to the spiritual, social and cultural life of their members and others in the community whose lives they touch. Nevertheless, their size, unique building systems, materials and craftsmanship place significant burdens on congregations in terms of the level of care and associated expenses.

Leaking roofs, deteriorating masonry and windows and outdated mechanical and electrical systems have reached a critical state of disrepair in older and historic religious properties. The religious community is confronting complex and critical maintenance issues with limited sources of capital funds. Alternate approaches will have to be developed in order to protect and maintain increasingly threatened religious buildings.

Religious Community Case Study:

The Archdiocese of Chicago is the steward of many historically and culturally significant religious structures. Not untypical of urban religious institutions, many of the churches have smaller congregations than originally. Many parishes also lack sufficient funds to maintain their church buildings. The Archdiocese today faces a large deficit and has frozen funds for capital maintenance. St. Mary of the Holy Angels will be discussed as a particular church in crisis.

Approaches To Technical Assistance:

A new approach to technical assistance from the public sector is offered by the Inspired Partnerships program. This is a new program funded by the Lilly Foundation and currently directed under the wing of the National Trust for Historic Preservation. Its purpose is to assist churches and synagogues in making informed decisions regarding the care and maintenance of their historic religious structures. Key concerns include maintenance planning, energy conservation, education and long-term planning, and financial considerations.

Steven Kelley, AIA, SE
Wiss, Janney, Elstner Associates, Inc. (Chicago Il.)

An approach to assistance from the private sector is found in Historic Structure Reports which help the religious community to better understand the physical resource of their building and how to protect it. It will also aid in the long term in making sound interpretive decisions for care and maintenance, or what we would call preservation.

Religious Properties Case Studies:
The following projects illustrate various levels of intervention and strategies in the preservation and restoration of historically and culturally significant structures.

Gammon Memorial United Methodist Church
First United Methodist Church of Oak Park
St. Ignatius Church, Chicago, Illinois
Holy Family Church, Chicago, Illinois

Conclusion:
The Association for Preservation is an important forum for the discussion of these issues as well as a resource for technical information. APT has much to offer in an educational role through publications such as the APT Bulletin, the Communique and through its training course programs.

CAMPUS PLANNING: THE ROLE OF PRESERVATION - THE MCGILL EXPERIENCE

Chuck Adler, McGill University, Office of Physical Resources (Montréal)
Brian Karasick, McGill University, Office of Physical Resources (Montreal)

Universities plan under ever-changing conditions. Teachers, students, government agencies, society-at-large, private donors - all these groups are continually evolving new directions and priorities for which Universities must adapt and often provide leadership.

A review will be made of the main issues which currently influence campus physical planning, with emphasis on the historical perspective. Using McGill University as a case study, a general summary will be presented of the evolution of the campus and the preservation policies which guided this evolution. Following this, a review of the current situation will outline the University's unusual situation of being within several municipal urban planning districts, a green space preservation zone, and a building heritage area.

The presentation will continue with various specific building projects which illustrate the University's preservation policy, and the impact of these projects on the campus. The presentation will conclude with comments on the future impact of preservation issues.

LANDSCAPE AS AN HISTORICAL FEATURE AT CORNELL UNIVERSITY

John Ullberg
Campus Planning Office, Cornell University (Ithaca NY)

University campuses are unique environments. They are distinctive in form and purpose, growing out of a learning community's need for sanctuary, nurturing, and inspiration.

As on most campuses, open space has been highly valued at Cornell. The original campus was carved out of a portion of the founder's farm, an extraordinary site amidst gorges, waterfalls, forests, and fields of the Finger Lakes region of New York. Indeed, it is impossible to think of Cornell apart from from its setting. Andrew Dickson White, the first president of the university, and Ezra Cornell, its founder, had a specific vision for the development of an institution of higher learning. This vision embraced plans for college grounds. In White's words, "At the opening of Cornell, a general plan was determined upon, with an upper quadrangle of stone, plain but dignified, to be at some future time architecturally enriched, and with a freer treatment of buildings on other parts of the grounds." Later leaders at the school enlarged on the inherent beauty of the site. Frederick Law Olmsted's advice was sought for siting campus buildings and creating an overlook at the western edge of the campus. In the early 20th Century Liberty Hyde Bailey, an early dean of the College of Agriculture, advocated the creation of an arboretum area adjacent to the main campus for field study and general enjoyment. By the 1920s alumni of Cornell felt so fondly about the physical campus that it was not unusual to have money donated that was earmarked for continued preservation and creation of more green space.

Over the years the accretion of buildings and roads subdivided and gave form and scale to the open spaces. Growth was welcomed. But Cornell, like most universities, is pressing against its boundaries today, facing increasing demands on this diminishing resource—open space.

As the campus needs grow and change, we have created and implemented systems to identify, categorize, and extend our campus's landscape assets—unique plantings, landmark structures, views out to the valleys and lake, and axes across spaces.

As an example of the challenges we face and must plan for at Cornell, a case study will be presented describing how open space needs and building expansion needs were accommodated in a current project. The central campus library, Olin Library, was constructed in 1958 on the Arts Quad, the oldest and most sacred of campus spaces. The building contains 2.6 million volumes. Olin Library was designed to accommodate 25 years of growth which it has now exceeded. Over the course of 3 years many strategies for expanding the library were studied. The selected option was for a 1.3 million volume underground addition, on a site of historic interest and containing a memorial of local and college significance. The solution is costly in dollars and in program—a fair measure of the value that Cornell University places on open space preservation.

PRESERVING CHANGE: LANDSCAPE OVER TIME - LANDSCAPE CHANGE AT THOMAS JEFFERSON'S ACADEMICAL VILLAGE.

Roger Courtenay
EDAW Inc. (Alexandria Va.)

Landscapes change over time, for both similar and different reasons than buildings and structures. Vegetation grows, matures, dies: landscape is subject to natural processes. Spatial structure, topography, views internal and external, garden and landscape character can all be affected. Entirely new functions with no historic precedent, like lighting, may be lain over the original landscape fabric. The presentation will focus on how these issues have been addressed at the University of Virginia.

Thomas Jefferson's Academical Village, built from 1817-1826, is now the core of a much larger university campus. Over the last six years, EDAW, Inc. has been assisting the Jeffersonian Restoration Advisory Board and the Architect for the Historic Buildings and Grounds (James Murray Howard) in making studies of and recommendations for the preservation, conservation and restoration of its historic landscape.

It was Rachel Carson who, some thirty years ago, in her book Silent Spring drew attention to the shocking consequences of what modern civilization has done to nature. Since then conciousness of increasing environmental problems have become important, also promoting new qualified technology.

It has taken longer time to realize that similar problems threaten also our man-made surroundings, not least art and architecture constituting an essential part of our cultural heritage.

GENERAL BACKGROUNG

Rapid and increasing deterioration of facades has been reported in many countries recently.

This phenomenon occurs with varying external circumstances, different of origins and any kind of architectural forms. It appears to be a matter of human concern to give reliable explanation of mechanisms and background factors, and expected consequences of this process. It is a high-priority task to find means for reducing and controlling this destructive course, and to maintain conservation of our urban and architectural environment.

The conflict between economic growth and care for the environment is eternal. Lack of knowledge and awareness has caused many catastrophies throughout history. On-going research and decision-making will hopefully pave the way for development of new and constructive approaches both through environmental policy and industrial development.

The basic problem might seem clear-cut and easy to formulate: one or the other of a few main factors is the main cause of desintegration of marble, limestone and other masonry materials: pollution resulting from combustion of domestic heating systems and/or that from exhausts of intense city traffic or industrial activities.

Current knowledge is insufficient. Neither do traditional conservation methods meet our requirements. Fortunately, an increasing number of experts have understood how comprehensive the problem actually is, and they have realized that significant research efforts must be mobilized in order to understand the process of deterioration, casual relationships, and to develop alternative courses of action: not only direct conservation measures but also integrated planning at large.

POLLUTION AND CONSERVATION: ISSUES

Jan Rosvall, Director and Associate Professor
Institute of Conservation (Gothenburg, Sweden)

HISTORICAL BACKGROUND

If we look back to well before the industrialized period, when no coal or oil were burned, we would guess that SO_2 and NO_2 concentrations in background air were comparable to "clean air" values. In towns, where the only sources of heating were burning of wood and manure, one would expect slight increases, perhaps mainly of nitrogen oxides. Already during the Middle Ages, it was reported from Westminster in England in 1288, that: "... on complaint by many inhabitants, that they are annoyed by lime-kilns in the said city and suburbs, ... wherein the lime was formerly burnt with logs of wood, it is now burnt by sea-coal, so that the air is infected and corrupted" (quoted from Peter Brimblecombe).

Along with the early industrialization, with roasting of sulphide ores and coal burning, we would expect locally increased values of sulphur dioxide. We had to wait until the 19th century for large increases of background values of sulphur dioxide and nitrogen oxides to occur in Europe.

Nevertheless it was clearly observed during the 17th century, again in England, that air pollution was a factor of importance, as described by John Evelyn in his book Fumifugium of 1661 (quoted):
"... the weary traveller, at many miles distant, sooner smells, than sees the city to which he repairs. This is that pernicious smoke which sullies all her glory, superinducing a sootly crust or fur upon all that it lights, spoiling the movables, tarnishing the plate gildings and furniture, and corroding the very iron bars and hardest stones with those piercing and acrimonious spirits which accompany its sulphur; and executing more in one year, than exposed to the pure air of the country it could effect in some hundreds. It is this horrid smoke which obscures our churches, and makes our palaces look old."

The following presentation provides a general background to conservation strategies and deterioration factors concerning building materials. A number of fundamental questions briefly summarized as follows:

* Has the deterioration gone so far that in many cases it would be meaningless to consolidate the objects?
* Would it be realistic and meaningful to perform, on a big industrial level, qualified operations recommended by modern conservation?
* What will happen, psychologically and in terms of cultural policy, if we are unable to take care of those environments which we take for granted?

DRY DEPOSITION TO STRUCTURES: CONFIGURATION CONSIDERATIONS

Rayford P. Hosker Jr., J.R. White
NOAA/ Athmospheric Turbulence and Diffusion Division (Oak Ridge Tn.), and
E.A. Smith
Preservation Assistance Division, National Park Service (Washington DC)

The concept of dry deposition as a spatially-averaged removal of pollutant species from the atmosphere to a landscape (typically covered by vegetation) tends to dominate the literature. However, in the case of pollutant interaction with materials, it is often not the spatially-averaged dry deposition rate that is important, but rather the strongly localized time-averaged deposition to specific types of materials (e.g., metals, masonry, painted surfaces) with varying chemical affinities for reaction with pollutant species. The basic factors which control transport, diffusion, and deposition of gases and particles are concentration, atmospheric stability and turbulence, mixing layer height, wind speed, near-surface aerodynamics, and surface moisture. All of these factors are altered in urban areas.

In particular, the mass transfer of atmospheric gases and particles to buildings and structures is affected by site-specific aerodynamics. Turbulent transfer to the material surface is potentially a rate-limiting step, and is strongly influenced by structure-specific air flow patterns. Edges, corners, projecting components, and carved ornament will tend to increase turbulence, and thus deposition, but can also shield neighboring portions of the building through wake effects. In addition, surface temperature and moisture ranges above and below projections and carvings will tend to be more extreme, because of shading from solar radiation and sheltering from incident precipitation.

This paper describes research to improve process-level understanding of localized turbulent transfer associated with selected traditional architectural components, and the resultant effect on deposition. A reduced-scale equestrian statue and a group of three architectural columns with variable inter-column spacing were separately exposed to a simulated urban boundary layer wind in a wind tunnel. Relative mass transfer rates were evaluated using the naphthalene sublimation technique. The studies were repeated for various angles of wind incidence, and with a simple wall and overhang near the column array. The method is qualitative, although areas of maximum and minimum mass transfer can be clearly delineated. Preliminary results are discussed. Work continues to derive quantitative mass transfer rates.

THE INFLUENCE OF BUILDING-SPECIFIC MICROCLIMATE ON THE DETERIORATION OF HISTORIC MARBLE BUILDINGS

Elaine McGee, US Geological Survey (Reston Va.)

Air pollutants in the urban environment contribute to the advanced deterioration of marble buildings through the processes of dissolution and alteration. Microclimatic factors such as exposure of the stone to direct or indirect rain, wind direction, and amount of sun exposure, as well as orientation of the building and the geometry of architectural features, are important influences on the type and amount of deterioration that occurs.

Dissolution of the calcium carbonate (calcite) that composes the marble is accelerated by the presence of sulfurous, sulfuric, and nitric acids in polluted air. Marble dissolution is characterized by sugaring of the surface (loss of polish), loss of individual grains, loss of details on carved surfaces, and loss of large pieces of stone. Dissolution effects are observed in areas of a building that are directly exposed to rainfall or to water flowing over the stone surface. Areas of a building that are sheltered from rainfall are also at risk from the influence of pollution. Sulfuric acid and water may react with the calcite in the stone to form gypsum, a hydrated calcium sulfate that is soluble in water and, thus, accumulates in areas that are sheltered from regular exposure to water. Particulate pollutants and dirt are readily trapped in the network of gypsum crystals that cover the original surface of the sheltered marble. The gypsum plus particulate pollution accumulate as a surficial crust that can be nearly 1 mm thick after 150 years of urban exposure and cause the marble to appear blackened.

On a coarse scale, direct exposure of the stone to rainfall results in dissolution whereas indirect exposure of the stone to rainfall results in alteration. On a smaller scale, local microclimatic effects determine how extensive either type of deterioration is in a specific area of a building. In Washington, DC, the garden sides of 80-year-old marble balusters that separate a patio from a garden are disfigured by a blackened and blistered crust of gypsum plus particulates, but the patio sides of the same balusters are only slightly grayed from surficial dirt.

In order to specify and quantify microclimatic factors that influence stone deterioration, we need to systematically examine deterioration and correlate it with measurements of microclimatic conditions around a building. Two monitoring points established on the east facade of the ~160-year-old Merchants' Exchange Building in Philadelphia measure pollutant and climate conditions that influence stone deterioration. Using these measurements with stereophotographs of architectural details of the building, we may be able to correlate the marble deterioration with its microclimatic exposure.

A SHORT REVIEW OF RESEARCH ON METALLIC MATERIALS DEGRADATION RELATED TO POLLUTION

Jean-Jacques Hechler, Industrial Materials Institute (Boucherville Qué.)

All materials exposed to atmosphere deteriorate under the action of natural parameters such as humidity, sunlight, etc., but also of "unnatural" parameters iike atmospheric poiiutants described under the broad term "acid rain". Major national and international exposure and research programs to assess the effect of acid rain on materials have been undertaken during recent years. Recent findings concerning metaliic materiais like galvanized steel, weathering steel, aluminium and copper wiii be presented. Deterioration mechanisms and damage functions revealing the portion of deterioration due to atmospheric pollution will be discussed. The problems in assessing the extrapolation of experimental resuits obtained with standards atmospheric corrosion techniques using small coupons to large materials surfaces on man-made structures will be shown through the results of a study of the corrosion rate of metals and the microclimates around a buiiding in Montréal.

DEGRADATION OF MONUMENTAL BRONZES

John D. Meakin and David L. Ames
University of Delaware (Newark De.)
Donald A. Dolske
Illinois State Water Survey (Champaign Il.)

Under the United States National Acid Precipitation Assessment Program, an environmental and metallurgical study has been made of a sample of the 50 bronze replicas of the Hiker statue cast by the Gorham Foundry, Providence, Rhode Island, between 1906 and 1966. The composition of seven statues cast over a period of 15 years was determined from bronze shavings and found to be closely similar showing that the statues were made of ounce metal or leaded red brass, 5% Zn, 5% Sn, 5% Pb, and the balance Cu.

The corrosion behavior of the statues has been studied macroscopically and a corrosion taxonomy constructed based on rectified color photographs, using CAD techniques to estimate areal extent of corrosion. To study corrosion damage on a microscopic scale, a technique was developed to take vinyl polysiloxane molds of selected features on the statue. Some depth measurements of the corrosion pitting recorded on the molds of the rifle barrel have been made for a number of untreated and one conserved statue. This technique has the potential for quantitatively monitoring the local corrosion at selected sites over a period of years and also characterizing the impact of conservation procedures. To provide information on metal loss, an attempt was made to measure the diameter of the rifle barrel in the region of the front sight and these measurements will be reported.

Scrapings of corrosion products were taken from a number of the Boston area statues and X-Ray diffraction analysis carried out. The samples were of necessity very small and limited the sensitivity of the analysis.

At Gettysburg National Military Park, Pennsylvania, incident rain samples were collected in parallel with runoff samples from selected bronze tablet-shaped brigade markers. Analysis for pH, metal content and various ion species yields information on the total rate of corrosion as a function of dry and wet deposition. The significance of these various measurements for estimating long-term bronze degradation will be discussed.

RECENT PROJECTS IN MONTREAL SHOWING THE EFFECTS OF POLLUTION

Martin Weaver, Martin Weaver Conservation Consultant Inc. (Nepean Ont.)

The city of Montreal in 1990 became the first city in North America to commission a publication on the problems of acid rain & air pollution in relation to buildings & outdoor sculpture.

The author of the works which is to be published shortly presents a summary of the problems & some conservation solutions illustrated from current work in Montreal.

VILLE DE MONTREAL: PROGRAMME DE SUIVI - MONITORING A L'ECHELLE URBAINE

Alain Leduc M.Sc.A.
Module Environnement, Ville de Montréal
Gérard Smolak, architecte
Module Bâtiment, Ville de Montréal

En Amérique du Nord, l'air se déplace généralement d'ouest en est avec des variantes qui ont pour origine les saisons. Près de 50% des émissions polluantes proviennent des Etats-Unis, tandis que l'autre 50% est produit par l'Ontario et le Québec. Dans ce contexte les gouvernements canadien et québécois ont mis en place des réseaux de surveillance de la qualité des précipitations qui sont localisées à l'extérieur des grands centres urbains. Afin de combler cette lacune et pour constituer une banque de données sur les précipitations urbaines, la Ville de Montréal échantillonnne et analyse depuis 6 mois les précipitations afin de mieux caractériser la situation montréalaise. Pour réaliser ce projet la Ville s'est associé avec l'Ecole Polytechnique de Montréal pour l'aspect analytique et avec l'Association pour la Prévention de la Contamination de l'Air et du Sol (l'APCAS) pour l'aspect éducation et sensibilisation. Ce projet du Module du génie de l'environnement permet l'échantillonnage quotidien des précipitations.

En tout, treize paramètres sont analysé qui recoupent le suivi des réseaux fédéral et provincial. La Ville de Montréal a tenu a sensibiliser la population montréalaise sur la qualité des précipitations reçues en mettant en placé un système de transmission quotidien des résultats d'analyse du pH des précipitations. Ces résultats sont, lorsqu'il y a précipitation, transmit aux média montréalais afin d'en informer la population. Le pH moyen des précipitations reçues depuis 6 mois est de 4.28.

Le module bâtiment du Service de l'approvisionnement et des immeubles de la Ville de Montréal a entre autre la mission d'établir des normes techniques d'entretien pour l'ensemble des propriétés de la Ville. L'effet des précipitations acides sur l'enveloppe et l'environnement des bâtiments devient une préoccupation importante pour la gestion des programmes d'entretien. Le module bâtiment a donc dans un premier temps fait exécuter des études sur ce sujet afin de mieux comprendre le phénomène et d'en prévoir son impact sur les programmes d'entretien. Ce document porte sur les bâtiments montréalais et explique les divers phénomènes reliés aux précipitations acides.

N.A.P.A.P.: THE IMPLICATIONS OF ACID RAIN RESEARCH RESULTS FOR ARCHITECTURAL CONSERVATION

Susan I. Sherwood
Preservation Assistance Division, National Parks Service
(Washington DC)

A multi-agency, multi-disciplinary research program on air pollution effects on materials, including cultural resources began in 1982, under the auspices of the National Acid Precipitation Assessment Program (NAPAP). The Environmental Protection Agency (EPA) took responsibility for modern construction materials (steels, concrete, paint, etc.) and the National Park Service (NPS) took responsibility for materials of historic importance, i.e., stone and bronze. Other Dept. of Interior bureaus, notably the U. S. Geological Survey and the Bureau of Mines, contributed to the research program in their areas of expertise, stone and metals, respectively. Estimates of the stock at risk were undertaken for both construction and cultural materials by EPA and NPS, respectively. The responsibility for analysis of the economic implications of physical damage and synthesis of the research information shifted over the course of the research program, with the result that integration of the various research results was not accomplished within the NAPAP framework.

In the absence of a comprehensive synthesis, it is difficult to provide categorical conclusions relative to the importance of air pollution and the conservation of cultural properties in North America. However, preliminary formulations for conservation treatment and city/regional planning decision making processes can be provided, based on a thorough understanding of the relative sensitivity of materials and objects to various types of pollutants, and the importance of pollutants in comparison with other agents of decay. For example, conservation treatments (type, timing, and extent) can be tailored to particular objects and portions of objects, based on a detailed understanding of the exposure characteristics. Secondly, this sort of research can provide useful input to planning decisions, for example, by estimating target levels of pollutants that can be tolerated based on the sensitivity of the resources at risk, and thus to optimize location of large scale (utilities, industries) or small-scale (roads, parking lots) polluters vis a vis cultural resource distributions.