It is always easier to define trends and contexts within architecture when looking back. Still, in this issue of Architectural Copper Review we will try, with starting-point in the present, to anticipate the future development in the building industry. And naturally with our usual emphasis on copper.

One of the trends right now is to integrate artists and their visions with new building projects. While buildings used to be adorned with art as an afterthought, we now find that artistic ideas more often influence building projects already in the early stages of planning.

A good example is Bispebjerg Bakke in Copenhagen, Denmark, where painter and sculptor Bjørn Nørgaard not only has taken the initiative and been the inspiration to the project, but also has worked closely with the architect and the building proprietor throughout the entire process. His artistic vision is combined with the architect’s specialist knowledge and the craftsmen’s skills. The result is convincing.

Gateway in Debrecen is the entrance to a university and library, designed by János Megyik. Also here are we entering the territory between art and architecture. Especially the choice of pre-patinated copper gives the building—or work of art?—its own characteristics.

Furthermore, we introduce Professor Marek Budzynski, Villa Astrid in Sweden and two remarkable projects from Danish architects Lundgaard & Tranberg. Architect Alf Folmer gives an example of how a building can serve the art, in two senses. His proposal for a new opera house in Stockholm is a whole-hearted attempt to start a debate on the subject.

Finally, I would like to take the opportunity to thank everyone who has agreed to be featured in our magazine, and thereby helped broaden its scope and international outlook. If you know of projects that would be of interest to our readers, you are always welcome to contact the editorial staff.

Best regards
Lennart Engström, editor

Bestill et gratis abonnement på Kobbber Forum på www.kobberforum.dk
Se aktuelt nyt om anvendelse af kobber i byggeri i hele europa på copperconcept.org
The Effects of Copper Products on Health and the Environment Have Been Studied

In 2000 the European Commission made official a brand new policy for future handling of chemicals. It must be proven that a material can be safely manufactured and used, with respect to people’s health as well as environmental concerns. This includes already established material as well as newly manufactured chemicals. A big difference is that the burden of proof will be transferred from the authorities to the industry. The new policy for chemicals is called REACH (Registration, Evaluation, Authorisation of CHemicals).

In view of this, EU invited a number of industry branches to perform voluntary risk assessments. The copper industry was in favour of performing such an extensive study to assess if the manufacturing or use of copper products involve any proven damage to people’s health or environment. The project was coordinated by the European Copper Institute (ECI) and has taken four years to complete at a cost of 80 million crowns, as well as big work efforts from different parts of the industry.

EU and the affiliated countries agreed that Italy would oversee the project, and on May 15, 2005 Italy could present the 400-page report, executed according to directions and rules from the EU-commission and using the best known techniques and science. It contains a large database with the existing copper levels in Europe, measured and estimated discharge from the manufacturing sites and from the use of different products, as well as estimated levels (risk values) for possible risk.

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The large study shows, among other things, that:

- The use of copper products is in general safe for the European environment and the population’s health.

- The population’s intake of copper through food and drink is sometimes too low, less than 1 mg per day for adults, which means a risk for copper deficiency. (Copper is of vital importance for many functions in the human body.)

- For lakes, streams and soil the measured levels are below estimated risk levels. (Estimations for the marine environment are still ongoing in 2006.)

- At a few manufacturing sites with inadequate water treatment there is a possible environmental risk.

- There is a risk for the work environment in the manufacturing of certain powders and chemicals.

Facts and conclusions in the report are collected in collaboration with researchers and Italian experts, but are still under discussion with the member states and may be modified.

Thus, the copper industry takes responsibility for safe production and use of its products, also called “duty of care”, and is now also well prepared for REACH.
New Green Church Spires

New, already verdigris green tall church spires dominate the Stockholm skyline once again.

During the last six months two of Stockholm’s tallest church towers have been hidden under scaffolding and netting. St. Clara Church in Stockholm city and the German Church in the Old Town have undergone extensive renovations of the towers.

St. Clara Church from 1590 is a cross-shaped building and the present tower was last rebuilt in 1886.

The new spire made the church the tallest building in Stockholm at the time. During the renovation the more than one hundred-year-old copper sheet was replaced by newly manufactured factory-patinated Nordic Green copper sheet, which is verdigris green from day one.

It was mainly the old bracket attachments, with iron nails that had corroded with time, that were the reason for the storm damage of the roof covering the last few years. Today non-corrosive screws are being used instead to attach the brackets on copper roofs. The
The German Church in the Old Town originates from the Middle Ages. After a violent fire in 1878 that completely ruined the tower and also threatened the church, a new, 96-meter-tall tower was built, designed by architect Raschdorff from Berlin, Germany. Master copper smith A. Lindström was given the task to perform the installation of copper sheet beginning in 1884. It is believed that the tower was completed some time during 1885. This tower has since then strongly contributed to the characteristic silhouette of the Old Town. The church is today built as a two-nave hall church in late Gothic style. Also here the renovation was performed with so called factory-patinated sheet metal of the type Nordic Green. In particular the old wrought iron had over the years been damaged by corrosion and needed renovation, but at the inspection of the copper roof’s lock clips it was discovered that the iron nail that fasten the lock clips to the to the roof in many cases had broken off due to corrosion, which made the renovation of the roof absolutely necessary.

Sheet metal consultant Stefan Lardner inspected the old roof in the spring of 2005, and drew up instructions for the renovation work. Oskar Janson’s sheet metal works in Stockholm performed the sheet metal work starting in the summer of 2005. A pole holds the church rooster and a copper ball is placed under the rooster. When the pole and the rooster were taken to the workshop for renovation, a document dated May 20th, 1885 was found inside the copper ball. The following was written on the document: “When the pole with the ball, the cross and the rooster had been put up in September 1884, and it was already decided which day this document would be put inside the ball, it turned out that because of a strong wind on October 26, the pole swayed too much. Since this could damage the tower it could not be approved as it was. Therefore, the pole was taken down and during several months a stronger, slightly shorter pole was made and has been put up again.” Inside the copper ball there were also black-and-white photographs of the sheet metal workers who performed the installation.

These two church renovations represent sheet metal craft of the highest standard, and they signal clearly to all who see them that outstanding sheet metal work can still be performed in the capital of Sweden. The church spires rest once again in shiny verdigris green high above the city of Stockholm and all is back to what it used to be.
In Switzerland copper is an appreciated and often used material thanks to its durability and a lively surface.

High level of workability, long lifespan, functionality and natural beauty are the reason for the frequent use of copper for façade and roof covering, and for other building elements. This is also true in Switzerland, where a new apartment complex under construction in Bern illustrates why architects often select copper.

The apartment complex Von Roll, which is under construction, consists of four apartment blocks, where the façade covering and the materializing of the architects’ vision have left a personal mark. The lively surface of the copper was one of the factors that decided the choice of this material for the façade with its checked pattern.

This was earlier the site for Van Roll metal factory, which was another reason for using a precious metal. The copper could be adapted to the building’s strongly structured façade. Copper is already abundant in Bern and its surroundings, for instance in nearby Paulus Church.

Copper is a good choice also on a long-term basis. With time, the pre-patination will continue with a natural patination process that will give the facades the desired dynamic character.

The green color of the elevations of the restaurant covered with patinated copper sheet by Żerań Park II compound is a real eye-catching landmark.

Żerań Park II is a continuation of an adjacent, earlier completed complex — office and storage Żerań Park I. The complex is one of the biggest projects of this kind with offices and storage space as well as light production facilities critically acclaimed by the biggest and most prestigious users. Żerań Park II includes four buildings with the total area of 50,000 m² designed according to the most modern logistic and storage management standards.

The office and storage compound is completed with the food court whose 500 m² façade is covered with 0.7 mm thick TECU® Patina copper sheets connected with the use of horizontal angled seam. The facade cladding with the pre-patinated TECU® Patina copper sheets required a lot of experience and high skills from the contractor. The building of the restaurant is the first building in Poland with the façade covered with TECU® Patina by German company KME.

Wall covering in a checked pattern with horizontal seam.
Project: Building contractor Von Roll, Bern
Architects: Rykart Architekten und Planner, Bern
Assembly: Ramseyer & Dilger AG, Bern
Construction period: 2003-2006
Size of squares: 470 x 311 mm
Total number of squares: 33,000 (6.75/m²)
Material: Nordic BrownTM dark-oxidated copper sheet
Pre-patination: Nordic Green PLUSTM
Area: Four buildings with 4 600 m² façade covering totally

Restaurant by a Storage Compound Żerań Park II, Warsaw.

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Architect: APA Wojciechowski, Warsaw
General contractor: HOCHTIEF Polska
Facade specialist: JANMAR-PREMUS Sp. j., Warsaw
Copper at the construction site: Product: TECU® Patina
Producer: KM Europa Metal AG, Osnabrück, Germany
Photographs: PCPM, KME Kajetan Jurkowski
Location: Warsaw, ul. Annapol
Built: 2005
Building owner: APOLLO-RIDA Polska
SERVIER Polska Head Office is a representative, newly erected building which catches the eye with the harmony of its classicistic form and functionality of architectural solutions.

The design of the Head Office of SERVIER Polska is one of many examples of universal classical architecture which does not succumb to passing trends in style. The combination of natural materials such as glass, limestone cladding and copper with the simplicity of the shape is a perfect match to serve the purpose of the building.

The mansard roof of the building with roof lights is covered with TECU® Classic copper sheet with the use of traditional technique – double lock welts. The roof truss is a combination of reinforced concrete structure and wood and the whole roof area is 2600 m².

The natural color of the roof covered with copper ideally corresponds with the color of the limestone cladded facade, emphasizing the significance of the building, whereas the high quality and harmony of the materials used guarantee the timeless beauty of the architectural solutions applied.

Servier Polska Head Office, Warsaw

Architecture:
Jan Losowski, Paris, France
Arch. D.E.P.V., Urb. S.A.T.G.

Design: Building design:
SEC-BOS, Warsaw

Construction design:
ARRF, Warsaw

General contractor:
BUDIMEX DROMEX S.A.

Roof constructor:
KREST METAL, Niepołomice

Product: TECU® Classic
Producer: KM Europa Metal AG

Photographs:
PCPM, KME Kajetan Jurkowski

Location:
Warsaw, ul. Jana Kazimierza

Built: 2005

Building owner:
SERVIER Polska Sp. z o.o.
Now it is Stockholm’s turn to get a new opera house. Copenhagen got their new opera house and Oslo is building an opera house that will be completed in 2008, while the Stockholm opera house dates back to the late nineteenth century. As an architect and opera enthusiast, I would like to present my idea for a new opera house in Stockholm: “La Nilsson”. This is a challenge and will be the basis for a debate. It all started with a presentation of the proposal in Swedish television’s cultural news program March 31st, 2006.

It started with my interest in opera house architecture, which grew even bigger through my friendship with the former director of the Stockholm opera, Eskil Hemberg. He told me that the old opera house doesn’t work for today’s productions, technical demands, acoustics, function and new thinking within the opera philosophy.

Later conversations with opera singer Birgit Nilsson inspired to new ideas. Both Hemberg and Nilsson were very interested in modern architecture. During the construction of the Copenhagen opera house I interviewed opera house architect Henning Larsen for an article about him and the opera house. I also followed the work of architectural firm Snøhetta with the opera house building in Oslo.

A city by the water usually wants its opera house placed near the water. The Copenhagen opera house sits on a peninsula above the water. The Oslo opera house is on the water. The opera house should also be an architectonic pearl, well visible in the urban landscape. Other requirements are good communications and parking facilities.

Perfect Location
All Nordic cities have the same problem: there is not enough space in the inner city. The opera houses of Copenhagen and Gothenburg are situated outside the city. Oslo’s new opera house is being built east of the city in an industrial area. Stockholm has the same problem. As former city planner in Stockholm I have concluded that the site that best fulfills the requirements is the eastern part of Långholmen that faces the city. The communications are good and there is enough space to meet the parking demands.

The proposal “La Nilsson” is based on the “clean-line architecture”. Embedded in the

DEBATE

alf@mbox316.swipnet.se
green leafy landscape, near the water, well visible in the urban landscape. The building is the same size as the Copenhagen and Oslo opera houses but also has room for the Royal Music Academy, the Royal College of Music, the Royal School of Ballet and the Opera Museum. The building covers a surface of 24,000 square meters. It has two stages, one large that seats 1,350 people and one small that seats 500 people. The basic shape of the building follows the contours of Långholmen’s east cape. To give an impression of lightness and floating, the base level is strongly drawn in. In order to have contact with the water and movement towards the city the northern part is formed like a tip that protrudes over the water. Here is the foyer with a view over the water and the city. All facades are made of glass. With lighting on the inside the building gives an impression of a crystal in the landscape. It is possible to project images and text onto the large glass facades that can be seen from large parts of the city.

The roof, part of the façade and the ground floor are clad with copper. With consideration to environmental requirements, rainwater from the roof is collected on a surface of concrete and limestone, which binds 95-99 percent of the copper ions in the rainwater. The inside of the building has predominately light-coloured birch wood. All this will give the building a Nordic atmosphere.

**Musical Centre**

The opera house is expected to entice people to come to Långholmen. The peninsula will get new life and become a living cultural part of southern Stockholm. Långholmen has good and fast communication to and from the city via Norr- and Söder Mälarstrand.
The visitors travel from all over the country by bus or car. From Västerbron on the centre of Långholmen a large traffic circulation area is suggested that leads traffic directly down to the opera house and a parking deck for 2,000 cars.

From the parking deck a walkway leads the 150 meters up to the opera house. A covered moving walkway takes the visitors directly up to the entrance level. Or visitors can take the “opera boat” to the dock below and continue up the elevator to the entrance level.

The main part of the park landscape is left for recreation, walking paths and a beach. On the other side of Långholmen there is already a hotel and room for a larger hotel and conference facilities.

With the new Royal opera house “La Nilsson” the facility will be Sweden’s Musical Centre, with performances, education, research and teaching for opera, operettas, musicals, ballet, concerts and theatre. With an estimated 400,000 to 500,000 visitors each year the “La Nilsson” opera house will be a trademark for Stockholm and will give Sweden a profile internationally.
Can One Live in a Sculpture?

The boundary between art, architecture and craft has been lifted in Bispebjerg Bakke in Copenhagen. A construction project that is equal parts apartment complex and work of art is now being finalized, the whole project using one hectare of copper.

Bispebjerg Bakke is impossible to place in a particular category. It has been compared to both a snake and a DNA-string that winds up the hillside northwest of the town centre. And the story behind it also winds back eight years in time. We find the origin back in 1998, when the Arts and Crafts Association and artist Bjørn Nørgaard together start a dialogue about apartment complexes built in an—for the time—unusually craftsmanship-like quality.

“I believe that the traditional craftsmanship and the classical materials have qualities that the industry can learn from and be enriched by”, says Bjørn Nørgaard, who is known for large art commissions, among other things. “Therefore our starting point was that as much as possible would be performed as a traditional handicraft. All walls are built by hand, using hand-painted bricks, which gives them a beautiful variation in colour.”

The artist has worked closely together with architect Jesper Holm at Boldsen & Holm Architects, and the two have been very visible in the process and on the building site. A nice detail is the decorative use of both red and yellow bricks. In the old days red bricks were used on the side of the building facing the street and yellow bricks on the wall facing the courtyard. This is one of many traditions that are being modified and used again at Bispebjerg Bakke.

Copper the Natural Choice
The walls in hand-painted brick have many inspiring details. The windows in South-American jatoba are maintenance free and get a beautiful greyish tint with time. The choice of material has not been compromised; it is of high quality and has a long lifespan. The same goes for the roof, which curves along the length of the building.
Copper is the natural choice for the roof covering, as it has qualities that support the philosophy behind Bispebjerg Bakke,” says Bjørn Nørgaard. “The durability is considerably longer than for instance zinc, and, unlike zinc, copper will get more beautiful with time. Up to ten coppersmiths at the time have been working with the assembly, and it has been a great pleasure to see them work side by side with bricklayers, carpenters and building workers at the site. The building is literally speaking built in a manner of craftsmanship.”

The roof is curving in several directions and emphasizes the organic shape that distinguishes Bispebjerg Bakke. It is like living in a sculpture. The roof is pulled away from the doors, creating a long and continuous shape. There is totally one hectare of copper roof and even though it was shiny at the assembly it will darken very fast.

Bjørn Nørgaard: “While the brick walls have their lively shade of colour from the beginning, the roof will get its own life over time. It will probably patinate in different ways, as the roof curves and bends in relation to the weather, winds and point of the compass. It will probably take 20, 25 or 30 years before the roof is completely light green. Considering the location on the hillside with the green surroundings, it will be a beautiful sight. It will live on and change. This is an exciting prospect.”

Well Thought-out Details
When looking at Bjørn Nørgaard’s background in experimenting art and his many sculptures and large art commissions, and at the same time considering the free, organic form of Bispebjerg Bakke, it is easy to see a main theme. But what about the handcrafted details of for example the roof construction? Has anything been sacrificed on the altar of art? We asked the architect.
“We have worked closely together during the whole process, in which I have contributed with my specialist knowledge and Bjørn with the artistic aspects – I think it has worked for the benefit of mutual inspiration”, says architect Jesper Holm. “The roof construction is a good example. The organic form is a vision that originates in the topography, and in the site’s past as a nursery for the Copenhagen municipality. But in the course of the planning we have found good solutions that have made the roof construction functional and durable.”

This concerns among other things the hidden gutters, which were built as mock-ups and tested with heavy downpours from water hoses before the design was finalized. The underlying roof with timber construction was built in modules by Tåsinge Træ and has basepaste board that will keep the water out. The copper lengths are individually cut to fit the double-curved roofline. They are fastened by a rubber hammer with a rubber seam laid in each individual length as extra protection against moisture.

Jesper Holm: “We have a total of 400 meters hidden gutters where the water is led to a drainpipe that is also made of copper. The copper is also assembled in visible places under the roof and, as Bjørn says, we will get a varied and completely unpredictable patination. We never considered pre-patinated copper, as the unpredictability will be one of the qualities of the building.”

The uncompromised choice of material, the use of the utmost craftsmanship and the unique shape have drawn much attention, and many leases have already been signed, even though Bispebjerg Bakke will not be ready for moving in until right before or after the turn of the year. There will be a total of 135 apartments in one, two or three levels, from two to six rooms and from 85 to 238 square meters.

Read more on: 
http://www.bjoernnoergaard.dk/bispebjergbakke/ and http://www.bispebjergbakke.dk/

Bjørn Nørgaard – Artist and Inspirer
The man behind Bispebjerg Bakke has been a central factor and a driving force on the Danish art scene since the sixties. Born in Copenhagen, graduated from the Experimental School of Art in 1964 and professor at the Royal Danish Art Academy 1985-1994. Known for happenings, painting, sculpture and commissioned art, as well as the tapestry at Christiansborg depicting the history of the Danish people. Richly represented at exhibitions and collections all over Europe. Masters both the exact detail and the monumental scale, which is obvious in this newly created building complex.
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The use of copper has always been a great challenge as the use of this material in architecture was forbidden during socialist economy. In Poland this resulted in eliminating copper from its typical applications which for many years have been so common in architecture around the world. At that time copper used only in historical buildings where the use of copper was the requirement of building conservation authorities. One of the first buildings designed by professor where copper is used was Our Lord’s Ascension Church in Warsaw. The church is a building whose red clinker brick walls are crowned with a copper sheet roof. The construction started and ended in the 80s during severe economic crisis in Poland. The parish priest must have used some secret technique to find the large amount of copper sheet to cover the great area roof of the church. The roof was covered with the classic Polish copper sheet. After some years the church belfry was built with covered with a copper roof and forged door—a symbol of entry of the Catholic Church to the 21st century.

The first monumental building designed by professor Budzynski in which copper was used to finish the columns and the facade of the building was the Building of Justice which was built in Warsaw on the Krasiński Square. The Building of Justice is an example of a public utility building in which modern architectural solutions are incorporated with historical architecture of the existing Buildings. The building fascinates with its architectural solutions. The Glass Facade of the Building made of reflection glass is surrounded by a colonnade which is made of patinated bronze.

Professor Marek Budzynski is an architect for whom creating architectural designs has always been connected with the harmony of the new building with its surrounding. A lot of designs by this author are monumental buildings which have both ardent advocates and bitter opponents. In his designs professor Budzynski often uses copper and he has been connected with this material since the very beginning of his professional career.
and copper. The colonnade pulls the Krasiński Square together and connects with the tradition. According to the idea of the design the frontage of the square is reinforced with the Columns of Law. They dictate the municipal space of the square and direct it toward the crucial buildings - Krasiński Palace, Garrison Church and the Warsaw Uprising Heroes Monument, strengthen their interconnections and indicate the main entry to the Building of Justice.

Each column conveys the content and ornamentation of the lettering of the selected quotes from Roman Law and a plant. The plants (bushes, trees and grasses) on the Columns of Law and on the square are individualized architectural details which create a bond between the buildings with the square and the park. They render the pursuits of the unity of Culture and Nature. The fusion of the technical functions (structure and ventilation) with the symbolic functions of the Columns of Law is an expression of the drive for the union of Art and Technology.

The patinated green color of the columns corresponds with the natural patina on the roof of the church and the palaces located in the close vicinity. The facade of the building blends with the green climbers on the patinated copper scaffolding. The harmony of the historical buildings, the green of the nearby park and the modern architecture of the Building of Justice is thus maintained.

The use of copper in the final finish of the decorations of the elevation and the interior of the building was a great challenge in the scope of technical aspect and assembly of the elements from patinated copper.

After a long period of oblivion, restrictions and ban the rebirth of the use of copper in such a large design proved very difficult but it was possible. Already at the stage of preparation of an offer a lot of discussions with potential contractors made the designers realize that the technology of machining of copper was totally forgotten and that after almost a 50-year ban on universal use of copper in Poland there are no experts in this field. The designers did not have enough knowledge of that special material they were dealing with. After finding providers of copper details and a group of enthusiasts of this material the designers managed to prepare technical designs which facilitated testing of some technological solutions already during preliminary work by making models of elements and conducting testing joints and fitting individual component elements.

This experience resulted in starting the belt production of
copper elements. This enabled the assembly of preliminary prepared prefabricated elements on the construction site. In total 240,000 kg of copper strip, 20,000 kg of brass sheet, 85,000 kg of bronze, 14,000 kg of copper tubes and 7,000 kg of copper rod was processed and used for building the designed copper elements. The Building of the High Court was completed in the years 1996-99.

At the same time when the Building of Justice was being erected the Building of the University Library designed by professor Marek Budzynski and Zbigniew Badowski cooperating with him was being built too. It was completed in 1999. Its area of over 60,000 m², 40,000 m² of which is the book space, can be extended by another 10,000 m². The building of the University Library can house 5 million books and it meets all requirements of a modern library of the 21st century.

What is fascinating in the design is the connection between nature and advanced technology. The architecture of the building, apart from serving its main purpose — in this case a library — represents a gigantic rack for vegetation.

On the roof of the library there is a garden with the area of 2,000 m² which consists of a few sections with different color, form and ambiance. The golden, silver, carmine-rosy and green sections are connected by paths with bridges and pergolas. The building is complemented with the entrance garden in the shape of a ramp ascending to the roof of the library.

The form of the building is ideally integrated with the landscape of Powisle at the foot of the Wisla River Bank.

The main elevation is slightly bent into an arc. The facade of the building is made of huge seven meter tall books. The first of them presents music score, the second — mathematics notes. Next pages of the open books are covered with golden thoughts in Sanskrit, Hebrew, Arabic, Greek, Old Church Slavonic and Old Polish. The elevation is made of bronze and artificially patinated copper because green as the color of ground vegetation, plants and landscape is associated with the Garden of Paradise and hope for eternal happiness.

In 2000 the building of the University Library was awarded the First Prize of the Association of Polish Architects for the most beautiful building of public utility completed in 1999.

The last project by professor Budzynski
where copper was used in the "House of the 21st Century". It is fabulously located residence in one of the towns outside Warsaw. The idea of the investor was to create a building which would be incorporated in a beautifully wooded plot. The house was founded on an artificially build scarp surrounded by a pond on the side of the terrace. The residence is a building which harmoniously combines brick, green grass and copper sheet as some sections of the copper roof combine with other sections of the roof covered with grass. The assumption of the design was to use pre-oxidized green material for the areas of the roof and facades covered with copper. It was supposed to create a uniform green area. Unfortunately due to the high cost of such sheet the investor used classic copper sheet and we will have to wait a dozen or so years for the effect expected by the author. The investor dedicated the residence two his two grandchildren. Two standing feathers located at the main entrance are a symbolic element which should remind the little girls to learn.

Marek Budzynski — professor at the Faculty of Architecture at the Warsaw University of Technology, in 1963 he received the diploma of architect; doctor of architecture, member of such organizations as the Union of Polish Architects (SARP), the Society of Polish Town Planners (TUP) and SCUPAD. He lives and works in Warsaw. Since 1960 he has had his professional practice. He has received numerous awards and distinctions in Polish and international contests, many of the designs have been completed or are being built. Professor Marek Budzynski teaches and has lectures in Polish and international schools of architecture and architectural development such the Faculty of Architecture at the Warsaw University of Technology, School of Architecture in Aarhus (Denmark) and University in żódź.
Façade proportions are based on the original design by Eliel Muoniovaara.

The building at the corner is one of a row of buildings constructed at different times.

Located at the junction of Suonionkatu street and Toinen linja street in the Kallio district of Helsinki, the three- and eight-storey business and residential building was designed by architect Eliel Muoniovaara in 1960. The housing company’s building forms one of the block’s corners and is part of a row of buildings stretching along Toinen linja street, built at different times, each with their own look, all the way from the round-shaped Ympyrätalo building up to the Helsinki Deaconess Institute. The façade of the building’s taller part is clad with profiled copper sheet.
– not the most typical material used in residential buildings – while the lower part is clad with coated fibre cement board.

The façade renovation was prompted by damage in the copper sheet’s under-structure. The underlying wood supports had partly rotted away, causing discolouration of the copper sheets and giving them a tendency to detach. Additionally, the 75 mm expanded cork used as thermal insulation in the 1960s has insufficient thermal properties according to current energy guidelines.

Another important renovation target was the apartments’ projecting balconies and their railings. The renovation done in 1980 had not created the desired results; instead, deterioration of the concrete and its reinforcement had continued and would eventually have led to prohibition of the balconies’ use. Furthermore, the appearance of the balcony railings was deemed unattractive.

The original copper sheets had holes in them due to additional screw fixings, and were therefore removed for recycling. New façade copper sheets – their material strength and profile almost equalling that of the original sheets – were selected from Outokumpu Oy’s Nordic Profile system. The sheets were fixed with screws fitted with seal washers. The fibre cement boards of the part of the building facing Suonionkatu were replaced with coated Glasal façade boards.

Essential upgrades were achieved by replacing the wooden support structure with a metallic one, replacing the thermal insulation boards with products that have better U values, and increasing their quantity.

Matt-polished Ylämaa granite was chosen as the façade material for the commercial floor. The stone panels were mounted with mechanical fixtures of stainless steel.

The projecting balconies were removed, and only their supporting rails retained. The new balcony slabs were cast as designed and were coated. The railings feature clear glass and the metallic parts are made of aluminium with a stoving finish.

The topmost balconies were fitted with copper-clad shelters.

Completed 2005
Customer: Asunto Oy Toinen linja 15
Architectural design:
Arkkitehtitoimisto Esko Ryhänen Oy
Esko Ryhänen, Architect SAFA
Leila Arosarka, Architect, B.A.
Structural designer:
Ins.tsto Taskinen & Eiskonen Oy
Jorma Eiskonen, Engineer

The natural stone surface contributes nicely to the overall appearance of the renovated façade.

Completed 2005
Customer: Asunto Oy Toinen linja 15
Architectural design:
Arkkitehtitoimisto Esko Ryhänen Oy
Esko Ryhänen, Architect SAFA
Leila Arosarka, Architect, B.A.
Structural designer:
Ins.tsto Taskinen & Eiskonen Oy
Jorma Eiskonen, Engineer

The natural stone surface contributes nicely to the overall appearance of the renovated façade.
The main building of the Varia Vocational College site, formerly the Tikkurila Vocational School, was completed in 1963. The building was designed by architect Eino Tuompo, who was selected for the task after an architecture competition. The building is a noteworthy example of modern architecture in Vantaa and has been designated as a protected building in the zoning plan.

In 2003, design work commenced on the College’s extension and partial renovation. It was felt that additional space was needed to concentrate the activities of the scattered College sites under one roof. Areas and rooms were designed in the extension for the purposes of cultural, travel, nutrition, economics and technical education. Moreo-
Ver, institutional kitchen and dining facilities serving the entire College were moved into the extension. In the second stage, the old facilities will be partly renovated. The fundamental design idea was to adapt the extension to the old building, even though the extension area is actually larger than the old facilities. Seen from the main approach direction, the extension is located behind the main building and, due to the contours of the land, partly below it as well. The glass-walled dining room with solar protective blinds is located in the part that links the two buildings together. On the other side, the workshop wings of the old and new buildings enclose a courtyard, to which most of the workshops open out. It was exceptionally decided that the cultural education workshops would open out towards the road for light traffic in order that the work of carpenters, painters and other craftspersons would be visible to people passing by.

Uniting the extension internally is a light shaft in the middle of the building. The elevated walkway at the light shaft overlooks not only the workshops downstairs, but also the nine training kitchens in the building.

Materials for the extension’s interiors were selected to create a workshop-like atmosphere. The interior walls are completely made of concrete masonry blocks, and in many places their surface is exposed. The rugged wall surfaces contrast with the sharp lines of the steel, aluminium and glass structures in the building frame and complementary structural parts. The warm glow of wood has been exploited in the dining facilities through the glulam columns, for example, that support the glass wall. The idea has been to avoid excessively pretentious designs, and to consciously create tensions through contrasts between materials and lighting.
Facades

The extension is bound to the old building by the façade materials, the similar-spirited window designs and the eaves converging at the joint.

The materials used in the original building – red brushed bricks and sheet copper – are of high quality and have aged beautifully. It seemed natural to use them also in the extension. Red bricks have been used in the main approach direction, while the walls of the workshop wing have been clad with pre-patinated profiled sheet copper (Rannila Design Tokyo, Nordic Brown). Copper was used for a number of reasons.

The use of band windows, a natural fit for the building, resulted in a need for light cladding material, since to support brick cladding with acid-proof steel components did not seem a natural solution. At the same time, however, it was decided to make no compromises in terms of quality, compared with the original building’s high standards. The copper’s surface, pre-patinated dark, helps the rather large and multi-faceted structures adapt to their surroundings. Considering the building’s life-cycle, the use of durable and maintenance-free material was justified, even though it increased the investment costs to some extent.

Extension:
Gross area 12,476 m²,
Floor area 11,999 m²,
Volume 65,381 m³

Design:
P&R Arkitehdit Oy,
Simo Rautamäki,
Chief Designer Pekka Salmi
Architecture from Austria, Holland, Belgium, Luxenbourg, Switzerland, Czech Republic, Germany, Denmark, Spain, France, Finland, Greece, Hungary, Italy, Norway, Poland, Sweden, United Kingdom

www.copperconcept.org
Creating Added Value

Gábor Sz. Szilágyi

A research institute and its representative building, architectural discourse on an urbanistic scale, the ergonomic interrelation of nature and architecture, minimalism and delicately applied materials, the formative interaction of architecture and art: these conjunction points are the basis of perception of the Life Sciences Institute and its Library Building in Debrecen (Debreceni Élettudományi Intézet Épülete és Könyvtára), by architects János Golda and Gábor Szenderffy, and the attached gateway designed by the sculptor János Megyik.

Gateway, designed by Mr. János Megyik

The gateway forming the entrance to the library of the Life Sciences Institute fulfils a central architectural role. It consists of an approximately 15 m high vertical element and a horizontal connecting element resting on the building at roof level. The core of the construction is irregularly punctuated by reinforced concrete covered with green prepatinated copper sheets, articulated by standing and flat lock seams. Seaming is the technique of joining copper or other metal sheets together for roof covering. The raster of horizontal and vertical seams is functional; this holds the copper sheets together and plays a part in the proportioning and visual build-up of the object.

In the past the attributes of architectural use of copper were more attuned to a historic rather than contemporary architectural environment. However, there are strong signs that the architecture of today has also discovered this material. Due to growing interest, the English Copper in Architecture Award, until recently only open to British entries, has been extended, as of 2005, to entries from all over Europe. The Debrecen Gateway was ranked in the top six of the large number and high quality contemporary architectural entries.

The János Megyik’s Gateway is the essence of the artist’s life’s work to date, focusing on perspective and projective geometry. The pile of rhythmically fragmented lines is put together from the application of plans resulting from perspective analysis and use of projective geometry of a Megyik’s drawing (Table and Stool) regarded as a primary picture of his art. The resulting artefact shows an entangled but structured mesh of geometric connections. The standing seams refer back to the artist’s earlier stick con-
structions, a method he applied to model other constructions such as various imaginary spaces based on architectural plans (for example Santa Maria Novella in Florence, 1980-81), interpreting the creation as a picture and as an architectural model.

Nevertheless, the gateway of Debrecen shows unequivocal affinity with the latest works of the artist. The characteristics of these are pierced surfaces, positive-negative forms or surface slashes, as much as multi-centricity arising from the application of several viewpoints. With his new works, Megyík speaks simultaneously of form and through the form the intention of creating form, the work of art and the absence of it, the displacement of centres of gravity and searching for new balances, new centres. In this perspective, the geometric fundamentals of the gateway of Debrecen, a vastly enlarged work, creates exciting tension between the modern outlines of the building and its own mesh of surface lines, displacing and reinter-
interpreting the purified space structure created by the buildings. The wall-like substance of the gateway juxtaposes the glass surfaces of the two buildings and provides vertical reading by its openings, directing the eye upwards, towards the sky. One of the main functions of the presence of the gateway is therefore displacement, the search and repositioning the centres of gravity. From the straight of the walkway the gateway makes us turn towards it, arriving underneath it compels us to stop and by examining the transverse lines, the rhythms and the apertures we experience the vitalisation of the geometry of the building.

In this way, the Debrecen Life Sciences Institute and Library Building by János Golda and Gábor Szenderffy with the attached gateway designed by János Megyik pose important questions on different levels. The building became part of an urbanistic discourse through definitive demolition, albeit with refined instruments, and recomposition of the essential elements of the town fabric: the symmetrical configuration and hierarchically constructed structure of the main axis. The architects also presented the public with a significant work of art in a new form, as an architectural element attached to the building, prompting the viewer to re-evaluate the relationship of architecture and fine art and the meaning of a work of art. The functionalism and minimalism of the building complex gained important synergy, creating added value through the gateway which, as an element of equal standing, has unquestionably fused with the conception of János Golda and Gábor Szenderffy to form an original and unique creation.
Wingårdhs Arkitektkontor AB was established in 1978 and has since then grown to become one of Sweden’s best known and most reputable architect firms, with offices in both Gothenburg and Stockholm.

Gert Wingårdh has the ambition to work with buildings that become attractive public landmarks. Among other things, he has his name on frequently discussed projects such as the Swedish Embassy building in Washington D.C., the control tower at Arlanda airport and Quay 01 in Malmö. www.wingardhs.se

I designed Villa Astrid in the summer of 2002, and Karin detailed and improved the plans during the fall. The site was squeezed in between two detached houses and consisted mostly of a harsh and rather steep hill. The detailed plan prescribed a roof edge at maximum 3.5 meters height and a roof fall of 14-27 degrees. My commission principal had a building program for a two-storey building. The solution was to “pull down” the second storey. It sounds easy, but took several weeks of sketching.

Villa Astrid is low and light as it sits below a large pine tree at the end of a narrow road. The carport and storage are on the left side and the entrance is placed in the otherwise solid gable. Inside the front door the lowered courtyard is a total surprise. What appeared to be a low building suddenly becomes three stories tall. For a while I considered covering the entire courtyard with a dark surface of water; this would have created the illusion of a six-storey building. However, for practical reasons the court-
yard is now a warm and sheltered outdoor sitting area and an ideal place for the family’s newborn girl, Karin.

Villa Astrid has an open kitchen, a secluded guest dining room and a large living room in between the courtyard and a sea view with afternoon sun and sunset. The latter are the reason for the turn of the house. At the end of the floor there is a work shelf raised one level over the rock. The gable facing the rock consists mostly of a large insulated glass window that has been lowered into a drilled rock slit. On the floor below there are two children’s bedrooms, a family room and a master bedroom. All rooms have direct contact with the outside through sliding doors and insect-protected ventilation windows.

The house is perhaps technically not the best the firm has designed. The roof was cast in concrete at the site, insulated with foam glass and covered with sheet metal. The walls are solidly built in concrete brick, plastered inside and outside and clad with sheet metal. The black copper sheeting will slowly patinate.
Freed copper ions will be bound by crushed limestone at the foot of the house. It is pure and maintenance free. The garden is not yet finished but is designed by NOD and consists of a Japanese section outside the kitchen window and back entrance, and a genuine west coast meadow below the sea view.

Address: Hovås, Gothenburg municipality
Architect: Wingårdh Architect Firm AB,
Head Architect: Gert Wingårdh
Managing Architect: Karin Wingårdh
Managing Engineer: Danuta Nielsen
Assisting architect: Joakim Lyth
K: F.B Engineering AB, Sven Blomgren, Per Hilmersson
V: N.V.K. VVS Kontroll AB, Göran Wigermo
E: Schönbeck Elprojekt AB, Rolf Andersson
Projektledning:
Wickenberg Byggnalys AB, Mats Johansson
Landscaping: NOD, Natur Orienterad Design (not shown on the photos)
Building proprietor: Private
Contract type: General contract
Building Contractors:
Bergman & Höök Byggnadsaktiebolag
Sheet metal Contractors:
Varla Sheet Metal, Kungsbacka
Total area: 400 sq.m.
Building cost excluding land:
10 million Swedish crowns
Building methods:
Prefabricated concrete, lightweight concrete, facades and roof in pre-patinated copper, Outokumpu
Foundation: Foundation plate on ground
Building time: 2003-2004
Let’s face it, we didn’t become the world leader in the copper industry because our name was easy to pronounce.

Outokumpu Copper Products is now Luvata

We chose our new name for more than just ease of pronunciation; we wanted to show that there is more to us than copper products. Luvata - a Finnish word meaning “to promise” - represents the commitment we make to our customers.

Of course, we will continue providing the highest quality products and services to our customers with the unfailing reliability they have come to expect. But we promise to do more.

We promise to help them improve operational efficiency, improve products and reduce capital that’s tied-up in many aspects of their businesses. Our promise means we are committed to partnering with our customers to help increase their competitiveness in the global market. After all, we can only claim success when they do too.

At Luvata we build partnerships with our customers; partnerships beyond metals.

To find out how partnerships with Luvata are shaping a wide range of industries, all you have to type is www.luvata.com.
An Honest Choice of Material
Choice of Material

At Lundgaard & Tranberg, original concepts are central when they plan their new projects. In their ambition to reach the strongest possible architectural impression they put much emphasis on an honest choice of material. They often leave materials untreated. This applies to two prominent buildings, among others, where tombak plays an important role.

Lundgaard & Tranberg Architects A/S on Pilestræde in central Copenhagen literally live in the middle of a building site. The entire historical block is about to be modernized, and the architects find themselves right in the Copenhagen building boom.

This has not stopped Lundgaard & Tranberg, which the last few years has been among the most successful firms with several award-winning projects, for example the new building for the Royal Danish Theatre at the waterfront that will be finished in 2007. However, the theatre building is not the reason for our visit with the firm, but instead two other buildings, where tombak has been used as a prominent style element: the Tietgenkollegiet and the Copenhagen Business School.

“Our position in the office is that we through an honest choice of materials will achieve surfaces that will be beautifully patinated with time”, says architect and partner Peter Thorsen. “We often leave materials untreated instead of covering them. We also want to challenge the materials and combine them in new ways. For example, the result can be striking when we put raw concrete together with a highly refined material. It will make you look at the materials in a different way.”

When looking at the earlier work by the architecture firm it is obvious that the architects take a strong position when it comes to the choice of material. Even though the projects have a wide span, from private apartment buildings to heating plants and from detached homes to cultural institutions, they also have what in lack of better words can be called human qualities. They become buildings that are nice to look at and be inside. And how does one achieve such a quality, for example in a hall of residence? Architect Peter Thorsen tells more about this.

Hall of Residence for the Future

“As for Tietgenkollegiet the task was to create a hall of residence for the future. In the first stage we created a concept of a project, in the second we created the actual project. Our entry won, even though we strayed from some of the conditions stated. We decided on a circular shape with eight
floors, which hold all of the hall’s facilities. The circle surrounds a courtyard and the building is cut through by five slits, dividing it into sections and creating passage ways to the central courtyard.”

The background to the architects’ choice was the desire to create a building that will blend in nicely with the surroundings in Ørestaden, Copenhagen’s new section, and at the same time keep its independent identity. The distinct shape emphasizes clearness, accessibility and community. One of the inspirations has been the traditional Tulou-buildings in southeast China, which are small-town commons with both individual houses and common facilities.

Peter Thorsen: “Individuality and community were two key concepts when we worked on the project. We choose for example not to give each tenant their own kitchen, but preserved the ”old-fashioned” idea of shared kitchens. The kitchens face the courtyard and provide a nice view of the other facilities, so that the students are not limited to their own part of the residential hall but also feel fellowship with those who live above them. With the shape of the building and the shared kitchens there is literally speaking a gathering point in the middle of the circle. Outwards they have their own individual spaces for recreation and studies.”

The architectural main theme, the distinct shape and the carried-out details prove that Tietgenkollegiet will remain a building of importance, but we will also look a bit closer at the choice of material, as one of them is tombak.

“We looked for an industrial, modern expression, so that the building signals that it was built to be used”, says Peter Thorsen. “Therefore we decided on a concrete construction, clad with tombak and with shutters in American oak. Both tombak and American oak are untreated and will patinate gracefully. Tombak preserves its glow for a long time and have all the right qualities for the façade.”

The façade material is an exclusive 1.5 mm tombak in a strong 90/10 copper alloy. It is very corrosion resistant as well as easy to work with, which is a requirement when it will be bent to cassettes for the façade. In this context, Peter Thorsen calls attention to Grønbech Construction A/S that performed this work and contributed greatly to a constructive dialogue and a successful process.

Tietgenkollegiet will be ready to accommodate the students in their daily life in the autumn of 2006. We
travel northwest to Fredriksberg municipality, where another of the firm’s projects has been taken into use, the so called “Kilen” at Copenhagen Business College. Tombak plays an important role here as well.

Lively and Modern Façade

“The entire façade of our building for the Copenhagen Business College have storey-high shutters in three different materials – wood, glass and tombak”, says Christian Schousboe Platz, who has been the managing architect. “Each office module has three shutters that can be operated individually from the inside. They can also be centrally operated when the building is empty, for example during the weekend if the sun is strong. All three materials are maintenance free, and with their different colours they give the façade a dynamic and contemporary look.”

The wood is ipé and the surface-treated glass is tinted green, while the tombak shutters have a natural, warm glow. There are a total of 888 shutters in the façade, with a mix of the three types in a way that makes the surface harmonic but still alive, especially when all shutters are closed. More of the wood and tombak shutters have been used than the green glass shutters, as the latter are more dominating.

“We considered several different materials for the shutters, such as aluminium, acrylic, zinc and galvanized steel, but it was tombak that won at last. We looked at the material’s natural aging process and the patina it will have in a few years. It harmonizes nicely with both glass and ipé and also shows our desire to both challenge the materials and let them show their honest and inherent qualities.”

Copenhagen Business College covers a very large area in Frederiksberg, and the new building – called “Kilen” (the wedge) because of its shape – is not the only edu-
cational building for the more than 15,000 students. The area is held together by green areas with lawns and trees. The rough terrain contributes to the area’s characteristics; Kilen is for instance for resting on two grass-covered “pillows.” The main entrances are cut into the mounds, and the different levels continue inside as steps in the central assembly hall.

“The basic idea for Kilen is the dynamic ground floor that stretches into the building’s atrium as an extension of the surrounding campus landscape”, says Christian Platz. “The three lower floors are public areas with classrooms, study halls, group rooms and a café, while the top three floors are reserved for research and administration. Only the lower floors have mechanic ventilation while the top floors have natural ventilation.”

Kilen at Copenhagen Business College is in general a good example of how Lundgaard & Tranberg allows the materials to be natural and honest – and at the same time combines them in a refined way. For example, the sleek and elegant winding staircase in the assembly hall is made of concrete, while the banister is covered with fine leather that gives a nice impression of quality and finish set against the raw concrete.

Christian Platz: “Many features of the building make it appear a bit raw, but it is the genuine materials that carry the project. Many of them are light-coloured, and we have combined them with strong colours like red and black to create living contrasts.”

The architects of Lundgaard & Tranberg are dedicated people, and we leave them with the impression that they have very clear ideas and positions. This is reflected in their projects, which often can be described in simple and convincing sketches. The same goes for the building for the Danish Royal Theatre, where they have chosen copper for the façades and the stage tower. We will return to this prestigious project in a future issue of Architectural Copper Review.
Red brick and light-green Nordic Green Plus pre-patinated copper give a rather special combination of heaviness and lightness. For Larkas Arkitekter it was therefore the natural choice of material when they planned Bryggeriet in Lillehammer; 74 flats divided between three buildings in the central part of the city, previously the site for among others Lillehammer Bryggeri.

Architects Harald Strandbakke and Andreas Bjørtuf have completed the block by giving the flats an urban side that faces the city in the west, and a more park-like view of the open area of detached houses in the east. Lillehammer Bryggeri was established as far back as 1850, but today the area accommodates a richly diversified group of buildings from different periods, primarily built in brick.

The flats at 42-137 m² were quickly sold, in spite of the price going up to nearly 3.5 million Norwegian crowns. But then again the houses are built in high-quality materials and the architects have succeeded to interpret the form language of the block. By choosing copper and brick they have given the facades a living surface that requires a minimum of maintenance, and with time will be beautifully patinated.