



1995 Technical Review
Summary
by Selma al-Radi

Restoration Of Bukhara Old City

Bukhara, Uzbekistan
711.UZB



Architects
*Institute of Restoration, Tashkent and
Restoration Office, Bukhara*

Client
Municipality of Bukhara

Completed
1975 and ongoing

Introduction

The old town of Bukhara conjures up magical images by its very name. Although it was already a town in the First Millennium BC, it became important historically in the 8th Century AD, when it was conquered by the Abbassid Caliphate (709). Bukhara flourished both intellectually and commercially, and by the 10th Century, under the powerful Samanid Dynasty, it became a renowned centre of the arts and of learning, especially the sciences and mathematics. The city's rich cultural heritage, commissioned by the generous patronage of its rulers, includes many architectural landmarks of the Islamic world, including the Samanid Mausoleum and the Kalyan Minaret. For the last 25 years, Bukhara has been engaged in an active policy to restore and revitalise the old town with its many monuments - and they are succeeding.



Bukhara is 500 kilometers southwest of Tashkent

town is officially celebrating its 2500th birthday in 1997, and Unesco is hosting the celebrations.

Local architecture

The overall impression of old Bukhara is of brick - the surrounds are brick-coloured and all the monuments are built of brick. The low skyline of two to three storeys is only interrupted by the tall minarets of the mosques. Only sections of the town wall and two gates have survived - the rest was destroyed when new roads were cut for traffic. New Bukhara, with its brutal-looking, concrete high-rises, its hotels and government buildings of the Soviet period, surrounds the old town on all sides.

Climate

Bukhara is situated on the edge of the Kizilkum desert and has a dry and arid climate. Summers are hot with temperatures that can go above

Context

Historical background

Bukhara is located about 500 kilometres Southwest of Tashkent, the capital of Uzbekistan, and 200 kilometres West of Samarkand. Excavations on the mound of the Ark Citadel have proved that a town was settled there by the middle of the First Millennium BC. Bukhara became an important commercial, artistic and intellectual centre after its conquest by the Arabs in 709 AD. It rose in pre-eminence under the Samanids in the 10th Century, during the Karakhan and Kara-Kitay

dynasties. It was almost levelled by Genghis Khan in 1226; few monuments survived the violent destructiveness of his Mongol hordes. Bukhara revived under the Shaybanid Dynasty in the 16th Century, but its importance decreased with the decline of traffic along the Silk Road. In 1753, it became an independent emirate and remained so until 1868, when it was incorporated as a vassal state under Tsarist Russia. Bukhara was forcefully taken by the Bolshevik forces after World War I; a number of monuments suffered during the bombardment. In 1990, Uzbekistan declared its independence; Bukhara became the capital of a province. The

Restoration of Bukhara Old City, Bukhara, Uzbekistan

40 degrees Centigrade in July, while winters range from -23 to 20 degrees Centigrade. Winds can be ferocious: cold in winter, and blowing hard sand in summer. The Zerafshan River, once a tributary of the Amu-Darya, used to flow near the town and once supplied water, via the Shahrud Canal, for its canals and pools. These were drained under the Soviet regime, as they carried diseases (especially gastric and skin diseases). The water was seldom changed and the canals became refuse dumps. A new drainage system was installed.

Site

Bukhara is an urban town with a population of 350,000 inhabitants. It has many industries, such as cotton gins. These do not impinge on the overall appearance of the old town. Roads have been cut into the fabric of the old town for the flow of traffic but, by and large, it has been directed outside its walls. Once inside the historic area, it is best to walk, a policy that has been encouraged by limiting traffic access within that zone.

Topography

Bukhara lies on a flat plain and is surrounded by semi-desert lands.

Programme

The restoration of singular monuments in Bukhara started in from the 1920's, but the restoration programme for the old town began during the early 1970's under the USSR. The main reason was probably financial, that is, for the development of tourism. The Soviet Union needed hard currency, and upgrading and improving the physical conditions of the old towns and monuments was necessary to attract tourists. At its peak, a million Russians and 100,000 foreigners visited Samarqand and Bukhara per year; the numbers have decreased in the last few years - tourism is not now as organised as it was under the USSR. Since independence in 1990, Uzbekistan has been redefining its identity and image, and the preservation and reintegration of its cultural and architectural heritage is an important component of this policy.

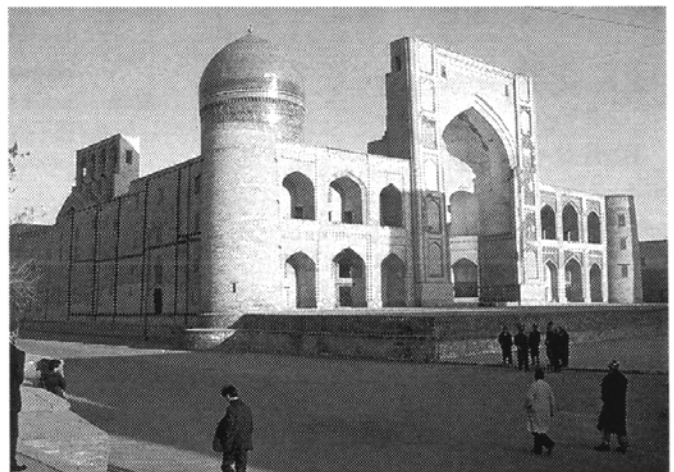


The Old City of Bukhara

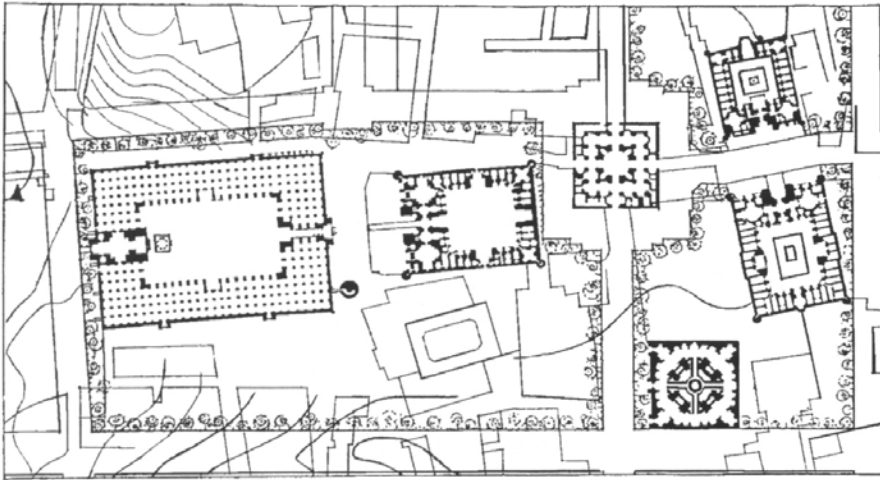
General objectives

The objectives of the Institute of Restoration of the Ministry of Culture in Tashkent were to revitalise the historic centres of the old towns by restoring, reconstructing or upgrading the monuments. Each monument had to be given a functional role that was appropriate to its architectural image. This was accomplished by researching and studying the original form and role of each - architects, historians and art historians took part in this exercise. Detailed drawings and project outlines were made for each monument, the analysis including every-

Views of the Mir Arab Madrasa dated 1536 before and after restoration



Restoration of Bukhara Old City, Bukhara, Uzbekistan



*Central Bukhara:
Restoration Plan*

thing from town planning to wall-construction methods, protection against earthquakes, and adaptive re-use.

Functional requirements

As the buildings were still standing, the details of each brief varied accordingly. All had to be restored and provided with basic utilities. They had to look architecturally “correct” in style; no new additions were permitted, although toilets and bathrooms were allowed. Most had lost their original function; there were few practising Muslims left after fifty years of Soviet rule, and they could not begin to use the plethora of mosques, madrasas, and khanaqahs that had survived. A new function had to be found for each, and it had to be a politically “correct” one.

Description

Building data

There are 997 historical monuments in the immediate Bukhara region, and 500 within the walls of Bukhara town. These include 24 madrasas, 48 mosques, 14 caravanserais, 9 mausoleums, 8 archaeological sites, 4 trading domes, 3 working hammams (and many more that do not), 265

listed old houses, and 34 varia that include the Ark Citadel, canals, and large sections of the city walls and its gates. The old town spreads over an area of roughly 3 by 2 kilometres, but the majority of the monuments are concentrated in the centre. They include such historically and architecturally important landmarks as the Samanid Mausoleum, the Magaki Attari Mosque and the Kalyan Minaret that survived the Mongol invasions of 1226, the Ulugh

Beg Madrasa built in 1417, the Kalyan Mosque dated to 1514, the trading domes of the 16th and 17th centuries, the madrasas of Mir Arab of 1536 and of Gaukushon of 1570, the Divan Begi of 1619, and many others. According to Sharipov, the Regional Planner for Bukhara Province, somewhere between 10-15% of Bukhara’s monuments have been completely or partially restored. Since 1975, about 25 monuments have been restored; many others had minimal repairs.

Each building has its “passport”, or document file, which includes plans and elevations, old photos, a description of its physical state, past and present, and its restoration history, and any other pertinent information. All the buildings of Bukhara have been documented,

*Samanid
Mausoleum built
in the 9th -10th
centuries*



Restoration of Bukhara Old City, Bukhara, Uzbekistan

*The Poi-Kalyan
built between the
12th and 16th
centuries*

though not all may have been drawn. The original portfolios are stored in the archives of the Institute Restoration in Tashkent, but copies of necessary documents are kept in the local Department of Protection of Monuments office.

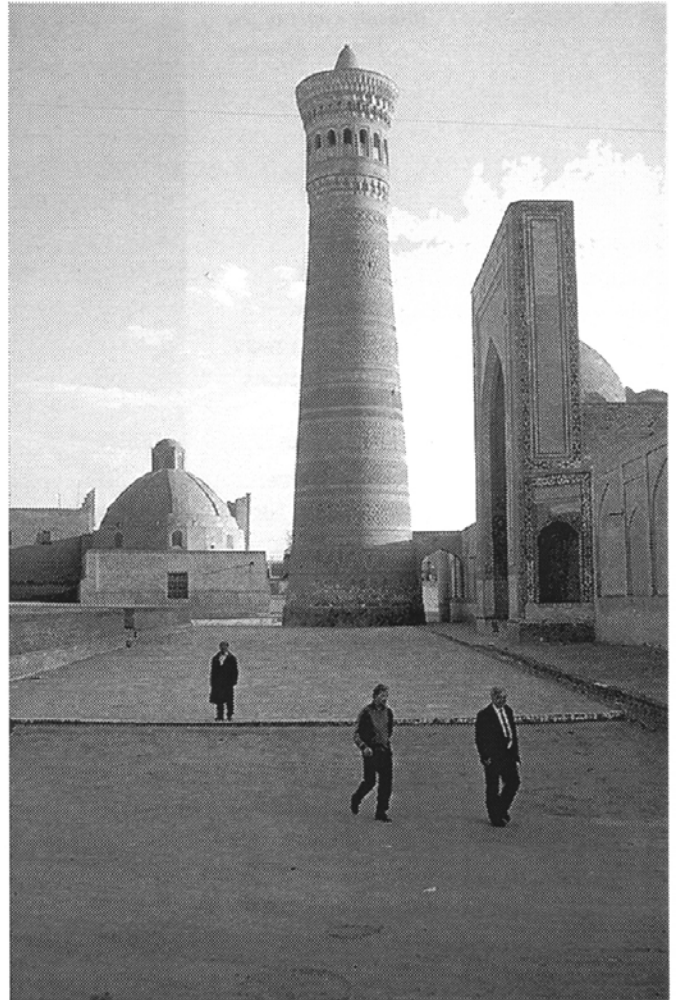
Design concepts

The buildings were still standing; minimal planning was required to keep the visual integrity of the town intact.

The restoration programme concentrated on the major monuments of the town and the areas immediately around them. Modern eye-sores that clashed with the historic image were brought down. As a result, large open areas were created within the old town that allow for good viewing of the architectural delights, previously lost in the mess and jumble of Bukhara that one sees from looking at old photographs. The new, planned and clean-cut look is easier for photographers, architectural historians and tourists as well as the local inhabitants. The purity of the lines, and the masses and volumes of Bukhara's architecture are now readily visible. The streets are easy to walk in and are animated by the lively shops selling a mixed variety of goods that cater to tourists and local inhabitants.

The buildings have been restored to their original forms, using traditional decorative features and motifs. Enough was preserved of each monument and its decorative treatment (glazed tiles, paintings, or carved bricks) to be able to reconstruct the rest.

The streets and the pavements of the old town are now paved, the
Restoration of Bukhara Old City, Bukhara, Uzbekistan



former with asphalt, and the latter with poured concrete slabs. The spaces around the monuments and mosques are paved with baked bricks. This has made the town more attractive, and has also reduced the dust. The main boulevards are lined with trees but the centre of the old town does not have much vegetation. Private houses have trees within their courtyards, while some canals and the banks of Labi-Hauz have stands of old trees. The recently landscaped area between Tim Abdullah Khan and the Abdul Aziz Khan Madrasa has been planted with trees.

Materials and technology

The basic building material is baked brick - these come in two sizes, 25 x 25

cm or 20 x 20 cm six-sided bricks. Prior to the devastating earthquake of 1976, only traditional materials were used in restoration. New regulations were then established that all buildings had to be built with cement reinforced with iron. This is particularly essential for load-bearing walls and portals. Cement is also used in foundations and as a mortar. The restoration office in Bukhara is trying to use more traditional materials now.

The material for reconstructing structural members of monuments is reinforced concrete. Foundations are rebuilt according to traditional methods, using layers of large river pebbles separated by twigs and branches of the kayraghach tree, over which are laid courses of cemented bricks. If the foundations are still

*Interior court of the
Kaylan Mosque*

intact or partially preserved, a supporting abutment is built up around them. Standing walls are strengthened by implanting iron rods or metal braces; new brick additions are mortared with cement.

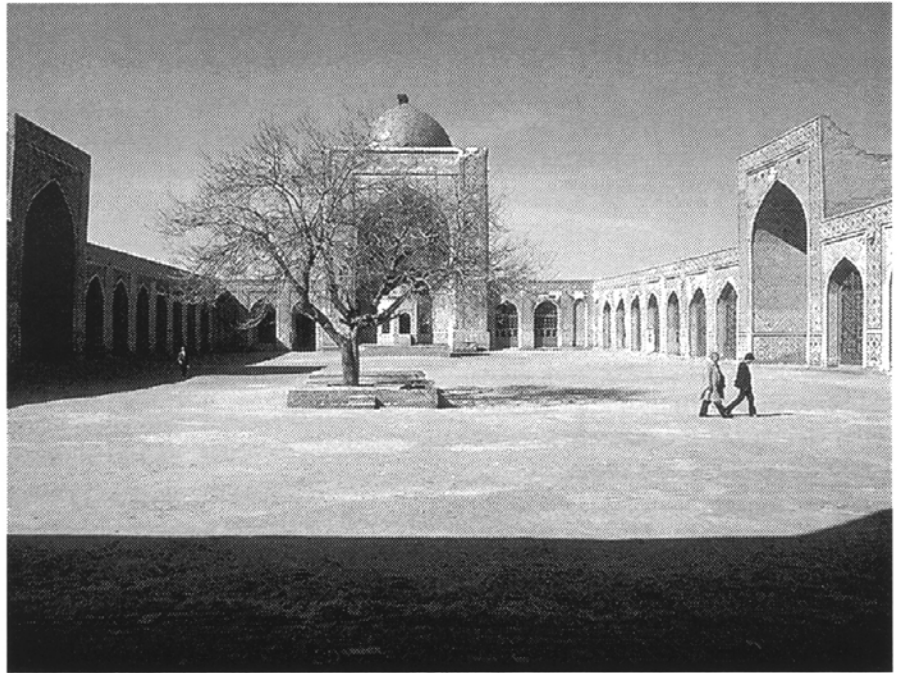
Mortar is either cement or the traditional *ganj*, a mix of gypsum, lime, crushed alabaster and ash; for water-proofing, crushed bark was added. Today, the gypsum is fired three times and combined in a cement mixer with crushed river pebbles; for fine stucco work, it is fired a fourth time. Traditionally, walls were strengthened with beams cut from poplars; today, iron rods do that work.

Wall surfaces are unplastered, the bricks acting as the decorative medium when carved or laid in differing patterns. Façades, portals, domes and interiors of mosques and madrasas are decorated with brick and glazed tile designs, notably in the Kalyan (1515), Mir Arab, Ulugh Beg (1417) and Abdul Aziz Khan (1652); minarets and mausoleums are decorated with alternating bands of inscriptions and/or floral and geometric designs rendered in high relief, in brick, such as at the Kalyan (1127), the Bala-Hauz (18th Century), the Chahar Minar (1807) and the Samanid mausoleum. A number of monuments use both decorative mediums, such as the Magaki Attari Mosque; others have painted decorations, among them the Abdul Aziz Khan Madrasa (1652), and the mosque of Mir Arab Madrasa (1536).

Construction technology is traditional in origin with new inclusions limited to materials such as cement and iron rods.

All the monuments and buildings of old Bukhara are supplied with water and electricity from the

Restoration of Bukhara Old City, Bukhara, Uzbekistan



municipality. A sewage system was installed but not completed for Bukhara. Parts of the town still use septic tanks, which invariably leak and can damage old foundations and walls. The buildings are checked and maintained by the local Inspectorate of Protection for Monuments.

Origins of:

Technology

The technology is traditional and of a fairly simple kind - coursed bricks bonded with mortar. The buildings are generally low in profile with the exception of the Kalyan Minaret which, at 43 metres high (plus another 14 metres for its foundations), is the tallest monument in the old town.

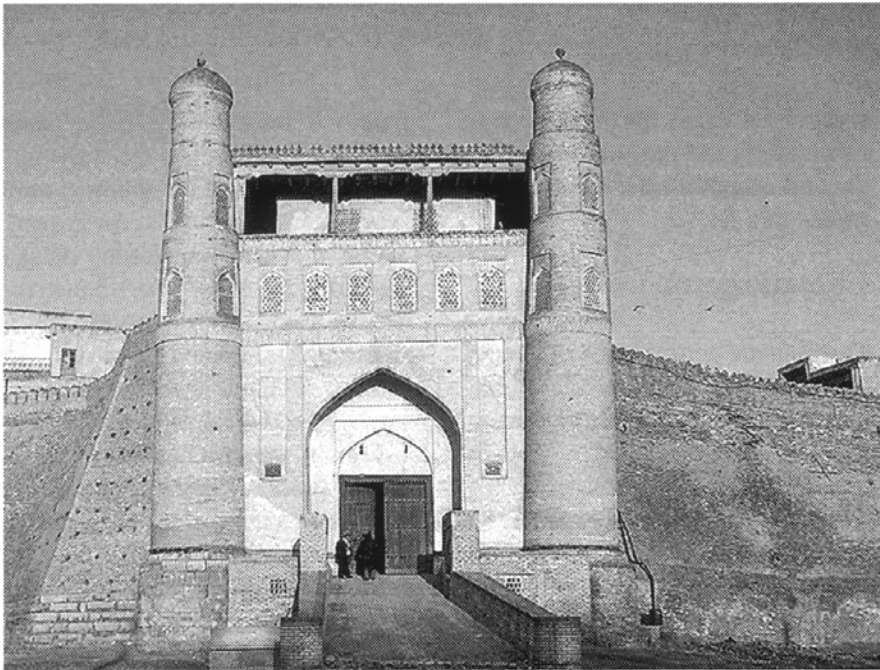
Materials

Materials are traditional brick and mortar; new technology has brought the addition of iron rods and reinforced concrete. Most supplies are provided by the Ministry of Culture in Tashkent, but the bricks and glazed tiles are locally manufactured

in a private company called "KosheKor". This is owned and run by Khairallah Salamov Aminoglu, the Director of the Inspectorate of Protection for Monuments and Chief Inspector for Restoration, himself a craftsman who specialises in tiles and comes from a long line of *ustas*; his grandfather carved the stalactites of the tympanum of the Abdullah Khan Madrasa in 1930, while his father took part in the restoration of the Mir Arab Madrasa. He will make the glazed tiles for the restoration of the latter's façade, and the blue tiles for the Kalyan Mosque scheduled to be done later this year. He tries to utilise natural elements and materials such as ash and desert plants in his glazes. It will be interesting to compare his glazed tiles with those made during the 1970's and 80's; they were of poorer quality than the originals and their colours were off - not a bad thing, since it differentiated the new from the old.

Labour force

The labour force is local, the specialised craftsmen or *ustas* usually belonging to a family with a long history in that craft.



Construction started in the 6th century of the Ark and continued through

restoration policy began in the mid-1970's, and is ongoing. For 1995, work will concentrate on rebuilding the fortification and glacis of the 18th/19th century Zindan (or prison), restoring 4 caravansarais (one in conjunction with a French Mission), the Poi Ostona Madrasa, and completing the landscaping of the Registan Square.

Costs and financing

Total costs for the restoration work to date are not available. For 1995, Bukhara requested a restoration budget of 100 million som, about 400,000 USD at the current official rate of 25 som to the dollar. 20 million som has been promised by Tashkent but, thus far, they have been given only 4.5 million som - sufficient for restoring one or two buildings. Under the Soviets, their budget was 1 million roubles, a lot of money at the 1984 exchange rate of 4 roubles to the US dollar. Today, inflation runs at about 600%. There are 40 restoration projects planned for 1996; the local authorities are hopeful that a special decree (for celebrating its 2500th birthday) will provide Bukhara with a more generous budget.

The budget is provided by the Ministry of Culture. Small donations are sometimes made by merchants or individuals to their local *mahhalas*, or city districts; these never amount to more than 1% of the budget. 3 million som was donated by private merchants towards the building of their shops in the trading domes, and although the land belongs to the municipality, they now actually own their shops. In 1994, the Municipality of Bukhara spent 22 million som; that was sufficient for landscaping

Professionals

Many architects have worked on the monuments in Bukhara. They were/are all employees of the Institute of Restoration in Tashkent. Each project was planned, budgeted and implemented by the architects in Bukhara, but the design details were always worked out by architects sent from Tashkent; they had to approve the plan and budget.

Contractors, engineers and other specialists are supplied by the Ministry of Culture in Tashkent. The

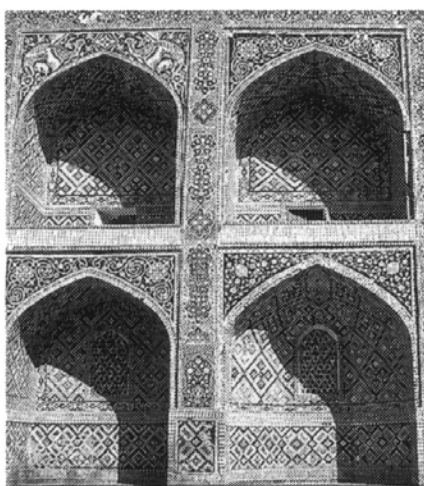
Municipality (Hukumiyat) of Bukhara is involved in the infrastructure, roads, communications, gardens and landscaping of the town; it uses its own personnel and budget. Foreign consultants are rarely used; an exception was made for studying the salt problem in Bukhara.

There are 34 guards and cleaners paid by the Ministry of Culture who care for the monuments in the old town.

Construction schedule and costs

History of project

The restoration of the monuments of Bukhara has been in progress since the 1920's, when repairs were done to monuments that had suffered during the Bolshevik bombardment; sporadic restorations continued through the 1930's. The systematic



Detail of Nadir Divan Begi Madrasa Façade

Restoration of Bukhara Old City, Bukhara, Uzbekistan

the area around the Kalyan and Chahar Minar, lowering the ground level in the trading domes, landscaping and planting the open area near the Ulugh Beg Madrasa, paving the Amir Alim Khan Madrasa, and paving the street that runs from the Kalyan Mosque to the New Bazaar and the Ark.

Comparative costs

No relevant figures are available.

Qualitative analysis of costs

One building can cost up to 2 million som to restore at current prices.

Maintenance costs

None are available; presumably maintaining the monuments is part of the city and state budget.

Technical Assessment

Functional assessment

The old town functions well. It is used continuously by the people who live in the immediate vicinity as well as by the more general population. People walk around, shop - there is a nice mix of goods available, everything from basic groceries to antiques - go in and out of museums and craft ateliers, have coffee in one of the coffee-houses, eat in a restaurant or shashlik stand, or sit quietly under the shady trees around the Labi Hauz pool. Sunday bazaars draw a crowd of thousands - one literally cannot

walk in the streets for the sheer mass of humanity and the number of shashlik stands belching clouds of smoke into the air.

Climatic performance

The climatic performance of the old buildings is generally good. Ventilation is good; lighting fixtures are fairly basic but adequate.

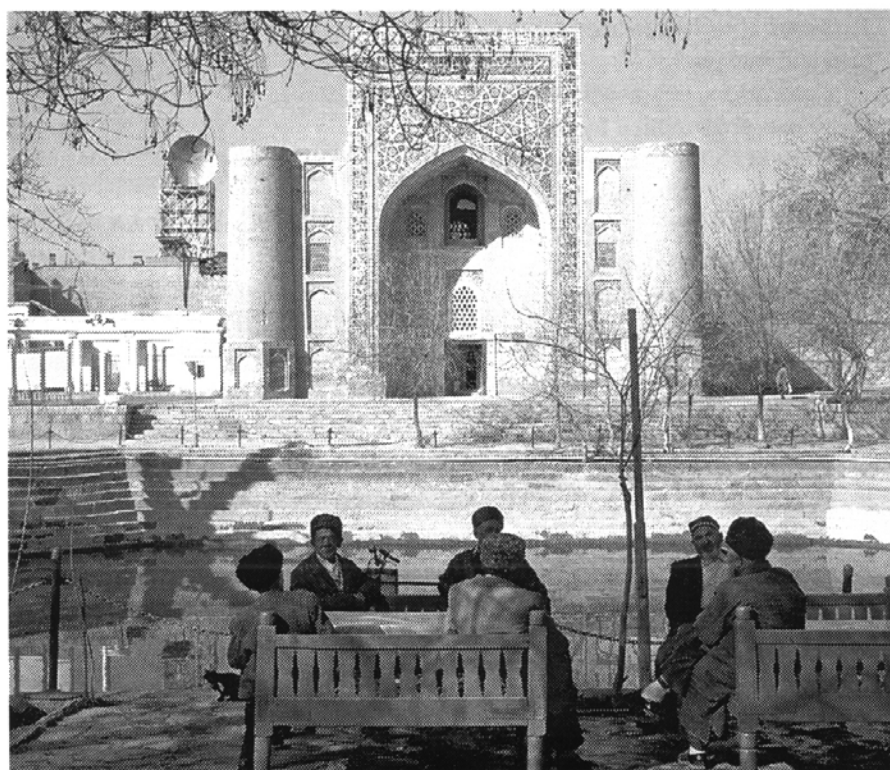
Choice of materials and level of technology

The choice of materials is circumscribed by that used in the original buildings; new and intrusive materials are generally hidden from view, although sometimes the cement is too evident. The level of technology is adequate to that of the craftsmen.

Ageing and maintenance

There is a serious problem in Bukhara, not so much with ageing or maintenance, but with the poor

quality of the materials, rising damp, and the salts that enter the walls by capillary action of the saline ground water. Since the 1950's, the ground water level has been steadily rising. Recently, the water rose 1.5 metres above the ground level inside the Samanid Mausoleum. A large number of monuments in Bukhara are covered with a film of salt, especially the lower parts of their walls. These salts attack the walls, break down the surface of the bricks and mortar, and cause tiles to crack, peel and fall off the walls. It is a serious problem for the new city as well. Landscaping is difficult - only few trees can survive the high saline content of the local water. Two reports have been prepared for the Ministry of Culture on Salt Damage to Important Islamic Monuments in Uzbekistan (by Robert Myers and by Akiner, Cooke, French and Myers, both in 1991). These reports suggest possible solutions but all require extra financing that the Uzbeki Government cannot afford. Some of



Labi-Hauz with the Nadir Divan Begi in the Khanagah the background.

Restoration of Bukhara Old City, Bukhara, Uzbekistan

the restoration work done during the 1970's was of very poor quality; the cement work and finish is sloppy, plaster is peeling off, and lots of bricks are chipped and broken. The plaster work of the Kalyan Mosque and its entrance is in such poor condition that it has to be redone. Others are not in such dire straits, but most require some attention.

The old town is fairly well maintained and clean, considering the number of people that use it on a daily basis.

Design features

Nothing quite matches the magic of walking down a street in Bukhara and looking at the mass of the buildings and monuments around one - it is truly an architectural phenomenon. The articulation of spaces has been much improved by the removal of 1950's style Soviet buildings that had been constructed within the old town; the few eyesores that remain are due to be pulled down soon. The old town of Bukhara now has a harmonious quality and appearance that is appropriate to its importance in the history of the development of Islamic architecture.

The design of the New Bazaar, built across from the Kalyan Mosque, fits fairly well within its historic context. The workmanship is of poor quality and the pine wood finish has been over-varnished. Perhaps it will age well.

Users

Every person in Bukhara uses and benefits from the restoration of the old town in one way or another. Those that are employed by the project benefit directly, the others indirectly. The rehabilitation of the old town has provided a venue for the craftsmen and women of Bukhara: coppersmiths, embroiderers on velvet and silk,

felt-makers, enamellers, potters and ironmongers have ateliers in the restored Divan Begi Madrasa. Tim Abdullah Khan, the old silk trading dome, has been returned to its old function, and the trading domes of Taqi Sarrafan, Zargaran and Tilpak Furushan provide shops for retailers of all kinds of wares - astrakhan hats, embroidered caps, antiques, dry goods, china, food and ready-made clothes. The shopping facilities are used by inhabitants of the old and new town. Outdoor and indoor cafes and restaurants attract customers of all income levels, while the weekly bazaars, which now also use the spaces provided inside the old town - in the newly built bazaar opposite the Kalyan Mosque and the row-shops just east of the Ark - bring in everybody from Bukhara and neighbouring towns.

The Abdul Aziz Khan Madrasa has become the headquarters and office of the Bukhara Restoration Office, its mosque has been made into a museum for wood carvings. The Ulugh Beg Madrasa across from it may in the future be turned into an Institute for Architectural Restoration which will work in conjunction with the Restoration Office to train restorers. Other monuments have been turned into museums: the Magaki Attari Mosque is a craft and carpet museum, while the Ark houses a museum of 19th century Bukhara. The Mir Arab Madrasa has been restored to its original function. The two-storeyed madrasa with its square courtyard and four iwans has forty rooms that house 200 students and their teachers. They are taught Arabic (I talked to a few, and they spoke it well), the Quran and the Hadith in the halls of the Kalyan Mosque across the street. There were 600 students at one time, but some were sent to Egypt and Saudi Arabia for further training. An extension that was to be constructed in an empty lot nearby has been postponed - funds promised by Saudi Arabia have not materialised - and only the founda-

tions (giant moulded concrete blocks) are in place.

The versatile and everyday uses that the old town has been put to make it an essential as well as entertaining part of peoples lives. At any time during the day or evening people can be seen walking, talking, shopping, drinking tea in the cafes, looking at the monuments or just passing the time of day. I think one can safely say that old Bukhara is alive and doing well, and not as a theme park.

The response of clients and users is very positive. Everyone I talked to seemed pleased with the rehabilitation and inclusion of the old town into their lives.

Project personnel

The clients are the Municipality of Bukhara, the present mayor being Karim Kamalov; the assistant mayors are Shuhrat Sharipov and Kamal Ajilov respectively.

From the mid 1970's, the architects involved are the following:

In Tashkent:

F. Ashrafi; T. Babaev; A. Bogodukhov; V. Filimonov; Z. Shlekht; V. Shvartz; Tokhtayev; B. Usmanov; I. Zhukova.

In Bukhara:

Nasim Sharipov, Chief Architect for the province of Bukhara and responsible for the monuments in the towns of his region.

Tuygun Babayev, his assistant, who designed the New Bazaar.

Mahmud Ahmedov, the chief architect for Bukhara city.

Khairallah Salamov Aminoglu, the Director of the Inspectorate of

Restoration for Monuments and the Inspector of Restoration; a master-craftsman specialising in tiles. He and Mansurova chair a meeting of the staff every Thursday to discuss problems and up-date the progress of each project.

Barno Mansurova, the Assistant Director and Chief Specialist in the Inspectorate, is an engineer who for the past 15 years has been virtually responsible for all the monuments. She examines and writes the technical assessments and reports on each building. She has a staff of nine.

Among the many specialised craftsmen are:

Mubin Mu'uminov, a specialist since 1954 on mosaics, façades, and cupolas, who has worked on Nadir Divan Begi and Abdullah Khan madrasas.

Jurakul Fatahov, a master builder who has worked on the Ulugh Beg Madrasas, and the Gaukushon - his son is a specialist on *ganj*.

Ahmed Bobomuradov, a master restorer who has worked since 1957 on the Amir's Summer Palace, Mir

Arab Madrasa and Kalyan minaret and mosque.

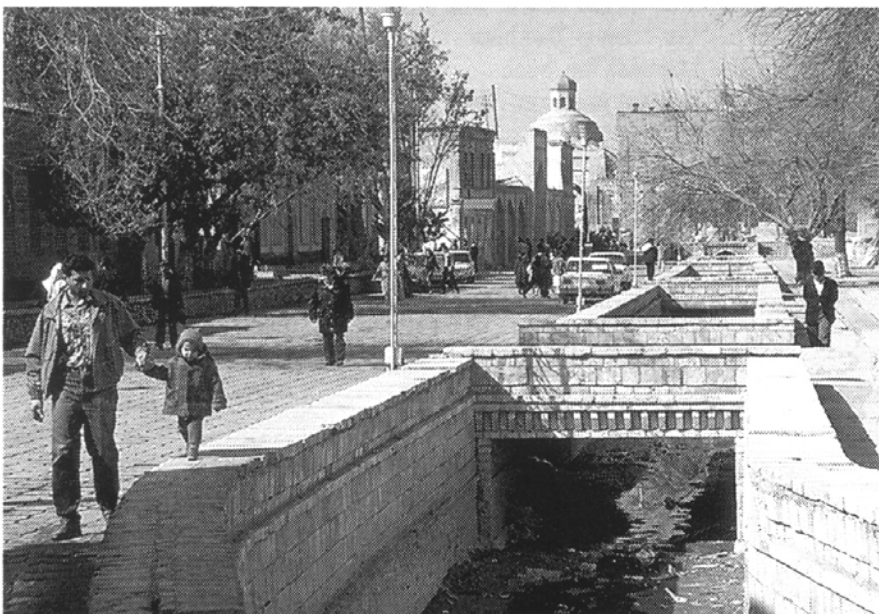
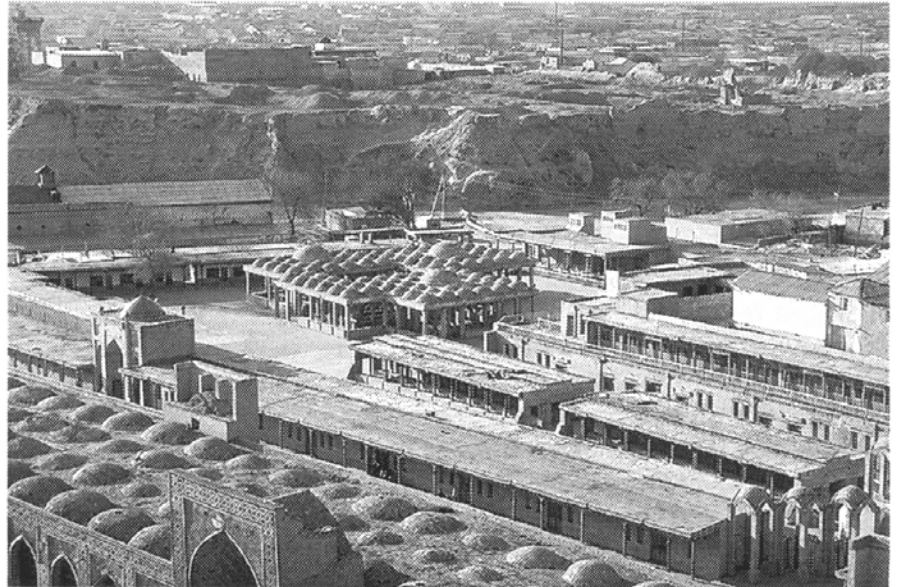
Sa'adullah Khojayev, administrator and financial manager, who is responsible for the restoration workshops.

Mahmud Rashidov, construction specialist and chief engineer who deals with all the *ustas*, and checks that the safety regulations are kept.

Bakhtiar Parsayev, the chief specialist who is in charge of quality and technical work; he is also a work supervisor.

All the above have worked on many other projects; they all have versatile talents.

*Aerial view of the
New Bazaar*



*Selma al-Radi
March 1995*

*Open canals
through the old
city of Bukhara*

Restoration of Bukhara Old City, Bukhara, Uzbekistan