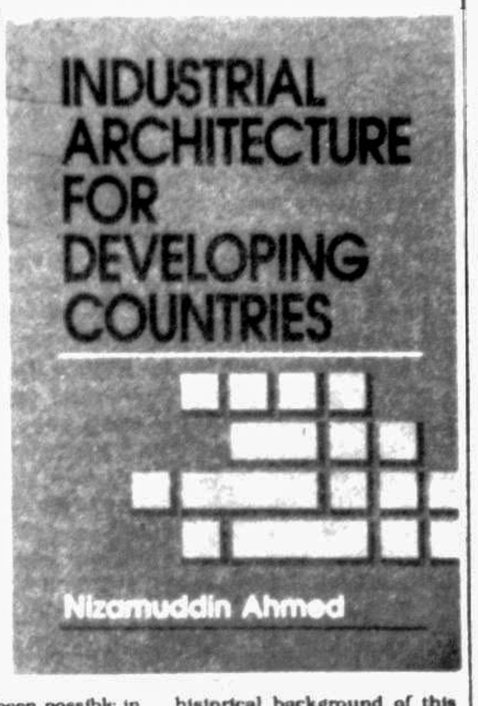
For a Workable Factory- House

Reviewed by Sharmeen Sathi Islam

Book Review

Industrial Architecture for Developing Countries, by Dr. Nizamuddin Ahmed, Vikas Publishing House, New Delhi, India



INDUSTRIAL Architecture for Developing Countries is a book that cherishes the unfulfilled dreams of workers in the factories of Latin America, Africa and Asia, including Bangladesh. According to its author, Dr. Nizamuddin Ahmed, "Seldom is a building a complete realisation of the dreams of the owner and, least of all, the users. The architect can rarely find in his creation a total transformation of his dreams. To this day, a factory building in a developing country has only existed to satisfy the financial motives of the industrialists; the government as owner has again failed miserably. The factory environment in our kind of world has more often than not been a nightmare for the factory workers; most never realised it and hardly anyone blamed the buildings or their creators. And, to the others, most of all the architect, the factory building has always been a ghastly sight."

The book, published by Vikas Publishing House of New Delhi, evolved because there is an obvious need to change the situation. Dr. Nizam observes that this change is required not to quench the thirst for aesthetics; but to create an environment that will motivate increased efficiency and thereby production, to create conditions that will reduce sickness and the risk of chronic diseases, to build industrial buildings that will symbolise the existence of humans within. The author asserts more than once in the plus-800 page script that the practice of giving machine the preferential treatment has to be reverted, not to pacify any trade union but to give credence to scientific revelations that improved working conditions can increase production, reduce absenteeism, sickness and labour disputes.

Dr. Nizam embarked on the research because he was convinced that in the coming decades and in the future beyond developing countries will be undergoing rapid industrialisation. Because such a large number industrial buildings need to be constructed as per certain requirements and specifications, Dr. Nizam carefully analyses each aspect that will cater to the safety, health and hygiene, welfare, comfort, efficiency, etc of the workers, a large percentage of which is presently deprived and disadvantage.

The book is a fervent appeal to policy-makers, government servants, industrialists, architects, planners engineers and other associated with factory buildings and workers' facilities who, according to the author, are not only unaware of the need to provide better working conditions but suffer from the disillusion that providing improved conditions is commensurate with increased costs. Dr. Nizam strums a positive note that the working conditions in many of the existing factory buildings and the ones of the future can be improved significantly by motivating to alter the attitude of policy-makers, government servants, et al.

Dr. Nizam points out that resources in developing countries are meagre and that in providing the buildings, albeit with their limitations, mistakes have to avoided. The luxury of trial and error method cannot be afforded. Poor countries will profit by capitalising on the lessons accrued by the developed nations. The book is a narrative of the generally deplorable and dangerous working conditions in factories. The enviable conditions inside factories of developed nations are contrasted explicitly in the book.

The lessons that the developed countries learnt in their journey to success should be useful to the developing ones, explains the author, even if only to indicate the routes to be avoided.

The book brings to light the facts that in view of the economic conditions, general attitude of the industrialists, compulsion to buy discarded and often cheap machinery, loopholes in legislation and lack of its enforcement, and other socio-cultural factors, the poorer nations have unfortunately generated industrial buildings and working conditions which are characteristic of these countries. Western and others from developed countries supplying machinery and technology, and often importing manufactured goods from these disadvantage countries, are usually unaware of the conditions in which the other half work and live.

The book will be immensely beneficial to entrepreneurs of the developed and developing countries because the author points out that in these days of joint venture initiatives it is essential and often vital for industrial developers to have a working knowledge of how industrial architecture evolves in the poorer parts of the world.

The publication in hardcover is the result of a three-year PhD work undertaken at the university of Sheffield, England between 1984-87.

The book identifies areas in the industrial buildings of the developing countries which require improvement and also the extent of such upgradation. Bangladesh, one of the LDC's, and its longtime colonial rulers Britain, being polarized as regards working conditions represents the two worlds. A comparison of the situations contributes towards understanding the nature of conditions that had been possible in the UK (and thereby a developed country) and to what extent knowledge may be transferred to countries such as Bangladesh (and thereby a developing country).

The recommendations made in the book for improving the situation in the developing countries are very pragmatic with due consideration to historical, economic, socio-culture and climatic aspects. Time and again it is emphasised that factors affecting the health and safety of the workers should be given utmost priority. Education, research and exchange of ideas find prominence in the book as tools to increase the much required awareness amongst all concerned.

In order to acquire through knowledge about the existing situation in Bangladesh one hundred industrial buildings of various types were surveyed. The reader will find useful feedbacks from the data and findings.

The books delves deep into architectural issues pertaining to the industrial buildings and includes such topics as the historical background of this building type, legislation pertaining to such buildings, locating industries, master planning and site development, landscape, structural features, materials handling, floor finishes, heating, ventilation and airconditioning, lighting, acoustics, pollution and its control, electricity supply, sewerage and sanitation, gas supply. Accidents, safety symbols and signs, fire prevention and control, security and emergency lighting.

Dr. Nizam's book is the result of a pioneering study on industrial architecture in a developing country. Indeed, books on industrial architecture worldwide are in short supply. This book will go some way in fulfilling the requirement of a wide readership of a very important field.

Dr. Nizamuddin Ahmed is Associate Professor at the Department of Architecture, Bangladesh University of Engineering and Technology, Dhaka and is the architect of a number of industrial buildings in the country.

Row Rages over Rao's Satellite Success

by D K Joshi

NOW self-reliant in satellite launch technology, India's space programme has been dealt a cruel blow by being placed on a Washington blacklist.

The United States administration also criticised Russia's Glavkosmos, the Indian programme's contracting organisation, for supplying cryogenic engines to India. The US is concerned that the Indian Space Research Organisation (ISRO) may have military implications that violate the Missile Technology Control Regime, and so has banned US licence exports to both parties.

Washington has also called upon other parties to the regime to impose sanctions against ISRO.

This comes at a time when, slowly but surely, India is moving towards joining the exclusive international space club. That prospect, after India's unwelcome entry into the nuclear club in 1974, has unnerved Washington.

The US ire is a tribute to Indian scientists who have made giant strides in the fields of space, nuclear and missile technology, notwithstanding the hurdles placed in their way by the West.

The Russian promise to stand by the $250 million contract signed in November 1990 for the supply of rocket engines has heartened India, but it is keeping its fingers crossed because of Moscow's vulnerability to US economic pressures.

New Delhi's reaction to what ISRO chairman U R Rao called Washington's "unilateral, unjustified and arbitrary decision" has been mature and controlled. It has not taken any retaliatory action, such as cancellation of the joint Indo-US naval exercise, as demanded by many Indian parliamentarians.

Prime Minister Narasimha Rao merely stated in parliament that the cryogenic and related technologies were meant for India's civilian space programme and "they do not and cannot have any military application."

The government has appointed an expert committee to assess the full impact of the US decision on its space programme. It recognises that the two-year ban will cause a setback to the indigenous satellite launching capability and to satellite manufacturing, but the space programme will not be crippled.

Rao admits that though the sanctions would not hurt the rocket programme which has been "going on very well", the satellite programme will face the real problem. Some 40 per cent of Indian satellite components come from the US and the embargo would cause delays and cost overruns.

Washington fears that New Delhi's successful space programme, which matches with its indigenously-developed missile technology, will not only make it a formidable military power in Asia but a commercial competitor for satellites and missiles.

The US, which resents New Delhi's self-reliance in space technology, fearing that it might emerge as a competitor in the global market, has banned export licences of such technology to India.

Asserting that the US action is dictated by commercial consideration, U R Rao said : "The Americans were apprehensive that India could become a major player in space launching and were making all attempts to prevent it."

He claims a team from the US General Dynamics company had visited India and held talks about selling cryogenic engines for a Geosuynchronous Satellite Launch Vehicle. ISRO rejected the offer because it was three times more costly than Russia's.

The Indian space organisation made a start in the export promotion of space technology by successfully executing an order for the supply of equipment for satellite application to Brazil. In addition, export of propellants for Indonesia's space agency is currently being processed.

The ISRO has already completed a consultancy project for establishing a sugar factory in Burundi and is also conducting a photographic survey for building roads in Nepal. Several foreign agencies are actively considering buying ISRO data.

As a government report points out: "The space programme is now set to meet not only a growing demand of the country for space-based services, but also to exploit the potential of the competitive international market for advanced space products and services."

Indian scientists are conscious of the defence implications of the space programme. Dr Abdul Kalam, the scientist behind India's rocket and missile programme, . claims that its "Agni" rocket, with a range of 2,000 km, would be too fast for any radar tracking system and its deadly accuracy of striking within 60 metres of the targeted site make it "one of the best in its class in the world."

Other medium-and short-range surface-to-air missiles are to be inducted into the defence system in the next few years.

India's space programme began in 1972. The first remote sensing satellite was launched in March 1988 and a second in August 1991. More advanced versions are planned to be launched during 1993-94 and 1996-97 respectively. The US ban may delay this schedule.

The Indian National Satellite (INSAT) system continues to provide vital operational services. There are 126 telecommunication terminals now operating in the INSAT network, which produce about 4,500 two-way speech circuits over 140 routes.

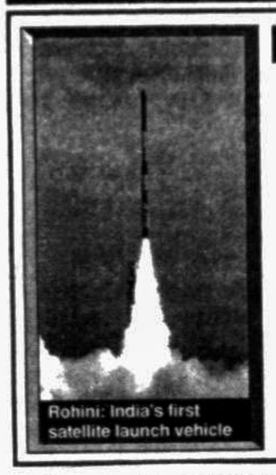
INSAT-2A, on board the European launch vehicle Ariane, and the INSAT-2 series of satellites, are expected to improve satellite communications and consequently open up new opportunities in their application for communication, broadcasting, and meteorology.

A new concept of GRAMSAT (village) satellites, specially tailored to meet the need of rural areas, has emerged.

It is being argued that with inputs from space, sustainable development in the countryside — without environmental degradation — has become possible.

It is ironic that the US should impose sanctions suspending supplies of US technology to the Indian space research organisation in the year designated as International Space Year by the United Nations for "promoting global cooperation." — Gemini News

Landmarks in Indian space programme


Rohini: India's first satellite launch vehicle

Date	Satellite	Function	Launcher
March 19 1975	ARYABHATTA	Scientific	USSR
June 7 1979	BHASKARA-I	Earth observation	USSR
July 18 1980	RQHINI	Earth observation	*SLV-3
June 19 1981	APPLE	Communication	*ARIANE
Nov 20 1981	BHASKARA-II	Earth observation	USSR
April 17 1983	ROHINI	Scientific	SLV-3
March 19 1988	IRS-IA	Remote sensing	USSR
Aug 29 1991	IRS-IB	Remote sensing	USSR
May 20 1992	SCROSS-III	Scientific	ASLV

2627 *SLV-3 (India),*ASLV (India),*ARIANE (European Space Agency)

When Will Car Telephones Ring?

by G V Joshi

CAR telephones will soon be introduced in the four metropolitan centres of Delhi, Bombay, Calcutta and Madras. According to reports, several multinational companies have submitted proposals to the Department of Telecommunications (DOT) for its manufacture in collaboration with Indian partners.

A car telephone — or cellular telephone (CT) as it is known in scientific parlance — operates by means of a radio transmitter connected to a switching office, and in turn linked to the regular land-line telephone network. It can be installed in a car or aircraft, or even carried in hand.

The CT technology divides a city into zones called "cells" (hence cellular telephone), each of a radius between one and eight kilometres. Calls can be transmitted to either a regular phone or to another CT, and as a caller drives from one cell to another, the call is automatically passed on to the nearest transmitter.

To avoid interference, base stations of adjacent cells would be using different radio frequencies, while cells separated by more than five kilometers may use the same frequency. The base stations would be located at carefully selected sites within a calling region.

CT technology uses radio signals with a frequency of 160 mega hertz. This is divided into 666 channels which would be allocated to the various ground base stations in the country. Four or five base stations are enough to cover the area of a city of the size of Bombay or Delhi.

CTs are different from walkie-talkie or citizen band radio sets which are essentially small transmitter and receiver units operating in a limited range. Any person using a walkie-talkie can be heard by any one in his range whose receiver is tuned to his frequency. For obvious reasons, only a small number can use this facility. If there are too many users, there is continuous interference and disturbance in communication.

As compared to cordless telephones, CTs have a greater range. The former are ordinary telephones without wires and can operate effectively only up to 225 metres from the main telephone instrument installed in homes. Such telephones can be used from any room in the house or from the lawn within the given range.

CTs can operate without wires throughout the city and can even be used to make long-distance calls within or outside the country through the direct dialling facility. They are more compact and therefore easy to carry. One model weighs only 300 gms.

CTs run on rechargeable, disposable batteries or through a car battery when installed in a vehicle. Internal batteries last for three to five hours. A hand-held model, which resembles a walkie-talkie with push buttons, weighs only 800 gms and comes complete with an antenna and batteries.

CTs have even replaced mobile radio phones. The system which was commissioned in Delhi before the Commonwealth Heads of Governments Meeting (CHOGM) in 1985, developed a number of problems. For one, it could not be expanded beyond the 177 subscribers initially connected to the system. For another, its range was not extensive, leaving subscribers with perpetually engaged tones. In congested areas surrounded by multi-storeyed buildings, the sound came very faint, almost inaudible.

As for CTs, the initial plan is to cover the entire New Delhi area with the satellite townships of Gurgaon and Faridabad in Haryana and Noida and Ghaziabad in Uttar Pradesh. According to one estimate, as many as 118 base stations would be required to provide quality service.

For Bombay, the area of the city municipal corporation, New Bombay and Kalyan telephone districts would be covered. In Madras, CTs could be used in the Maraimali Nagar Export Promotion Zone, Minjur and Mahabalipuram in addition to the city's municipal limits. In Calcutta, the service would be limited to the city, limits only.

The system at Bombay would be more advanced than in the other cities, as it would be using digital technology. The main switching centre would be located either at Prabhadevi or Mazgaon and transmission towers would be positioned at the eight "cells" : Cooperage, Malabar Hill, Prabhadevi, Ville Parle, Kandivili, Thane, Mankhurd and Belapur.

To be launched some time in 1993, the Bombay CT system will cost every subscriber at least Rs 100,000 for a single line. This would includes the cost of fixing the transmitter equipment at various sites, installing the exchange switching centte and providing the junction network at base stations.

The DOT has envisaged an ultimate capacity of 40,000 subscribers in each of the four metropolitan cities, though no systematic survey has yet been carried out. The ultimate aim is to have the CT system in all towns with a population of more than 500,000.

The CT will be quite expensive even to operate. The monthly rental will be about Rs 3,000 and the rate for a local call will be about six or seven rupees.

The Government has already indicated that the DOT and the Mahanagar Telephone Nigam, which holds monopoly in the telecommunication sector, would keep themselves out of the CT service. Tenders have therefore been invited from private operators and a decision on them will be taken in the near future. The Government would benefit indirectly as the private operators would be utilising the services of the existing land-line telephone network.

The result: an unlimited number of phones can have the number with all calls billed to the legitimate number. The swindle invariably goes on for a couple of months after which the phone company shut off the connection for non-payment of bills by the legitimate user. — PTI Feature

Mr. Joshi is a science writer based in Pune.

Safer Current Measuring in HV Cables

SCIENTISTS are making a new bid to find a safe means of measuring current in high voltage cables. Use of an electrical meter for this particular application is dangerous because it brings the voltage down to earth.

A team from the physics laboratory at Kent University in south-east England led by Dr. David Jackson believes a combination of fibre optics and a clampmeter could be used to solve the problem, reports *London Press Service*.

The clampmeter is a wire loop that is clamped around the main current carrying cable buzz bar. The current crates an electromagnetic field which stimulates a voltage in the loop. This loop is connected to a piece of pizoelectric material that stretches when a voltage is applied to it.

The stretching is converted into an optical signal by using a fibre optic version of an interferometer. In this way, the reading from the clampmeter is converted into a fibre optic signal which is measured to ascertain the original voltage.

The use of such a fibre optic current sensor would provide safety because it does not bring the current to the ground, the fibre optic cable providing the electric insulation. And unlike most optical sensors, it uses the proven technology of a clampmeter — a feature that could make it attractive to potential customers.

Dr. Jackson says wide applications are possible but it would be used mainly in switchgear at power generating stations. Such a device would add to overall safety in the stations because large currents at any point could be measured, surges could be detected and potential fires prevented. British Rail is interested in using the device to measure the current obtained from high voltage cables above the track.

The development of the new sensor is being carried out as part of a national scheme to promote technology transfer between UK universities and industry. The scheme provides full funding for the university partners and 50 per cent of the total costs.

SALT Farming System Ideal for Hilly Lands

by Romeo B Abundo

SALT is sweetening the income of the poorest farmers in hilly areas in Mindanao and in a few other countries in Asia.

It also holds out bright promise of arresting soil erosion that may yet turn vast tracts of logged-over areas into wasteland.

Conceived and developed by the Mindanao Baptist Rural Life Centre (MBRLC) in Kinuskusan, Davao del Sur, in southern Philippines, the Sloping Agricultural Land Technology (SALT) can boost an upland farmer's income from US$120 to US$600 per hectare a year.

MBRLC is a non-profit, church-related private volunteer organisation sponsored by the Philippine Baptist Mission and the Foreign Mission Board of the Southern Baptist Convention in America.

As a simple agroforestry technology, SALT can easily be adopted by upland marginal farmers. Simply put, it is sustainable growing of trees and cash crops on contoured terraces along the hillsides.

SALT basically "is a method of growing field and permanent crops in 3-metre to 5-metre wide bands between contoured terraces of nitrogen-fixing trees," explains the Centre's director, Rev. Harold Watson.

These trees are thickly planted in double rows to make hedgerows. Rows of permanent shrubs are dispersed — throughout the farm plot. Strips not occupied by permanent crops are planted alternately to cereals or other crops and legumes.

"This cyclical cropping provides the farmer some harvest throughout the year," says Rev Watson. "SALT also includes planting of trees for timber and firewood on surrounding boundaries. Lately, livestock growing has become part of SALT.

Sloping Agricultural Land Technology, or SALT, involves cyclical cropping which provides farmers some harvest throughout the year

The SALT programme began to take shape on a hillside of a village called Kinuskusan in Bansalan, Davao del Sur in 1978. This was when Rev Watson was assigned to develop and direct a church camp in the area.

Coming from a farm family in Hattiesburg, Mississippi, Rev. Watson acquired an adjoining hillside with help from a benefactor from Nashville Tennessee, to experiment on techniques of soil erosion control.

"In the beginning we tried may ways to stop the erosion and rebuild soil fertility," recalls Rev. Watson. "None of them really worked."

Then the Baptist minister obtained seeds of the giant ipil-ipil, a nitrogen-fixing tree, from Hawaii. With the help of a dozen professional agriculturists, he developed SALT, planting double hedges of ipil-ipil on contours four to six metres apart and raising crops (corn, beans, pineapple, coffee, bananas, peanuts, sweet potatoes) and fruit trees between the hedges.

The technique worked. Soil erosion has been minimised, soil fertility restored, food production sustainable and decent income for upland families generated.

For their untiring efforts to help the poor upland farmers in the area, Rev. Watson and his associate director, Warlito Laquihon, received the Ramon Magsaysay Award for International Understanding in 1985.

The award was in recognition of their "encouraging international utilisation of the Sloping Agricultural Land Technology to help the poorest of small tropical farmers."

The Centre itself has received awards from many institutions. Among these was a Presidential citation in 1989 for teaching large numbers of resource-poor farmers which increased crop yields and reduced soil erosion on sloping lands.

Because of SALT's initial success, two more agroforestry variants have been developed. These are Simple Agro-Livestock Technology (SALT 2) and Sustainable Agroforest Land Technology (SALT 3).

SALT 2 is a goat-based agroforestry programme with a land use of 40 per cent for agriculture, 20 per cent for forestry and 40 per cent for livestock.

SALT 3 is a cropping system in which a farmer can incorporate food production, fruit production and growing of marketable forest : trees.

SALT is now being adopted in Thailand, Indonesia, Sri Lanka, Nepal and Vietnam. What's more, some 25 other countries have sent representatives to the centre to learn more about SALT and its potentials.

Rev. Watson admits SALT is not a magic formula. Nor is it a perfect farming system. "No system can bring depleted, eroded soil back into production," he says. "But land can be restored, upgraded and sustained to a reasonable level of productivity by using."

— Depthnews Asia