Chemical Conversion of Jute

An Industrial Breakthrough Fails to Owe Its Debt

by Raffat Binte Rashid

Jute is now facing strong competition with synthetic fibre for its traditional use, and as a result, the demand for jute goods is declining in the world market. In the near future, we may not only lose our world market of jute, but also deprive ourselves from our cash crops. Therefore, it is the proper time to think over the alternative use of jute.

FOR the first time in Bangladesh and the world at large the chemical conversion of jute has been successfully carried out.

The conversion done by the Soda Anthroquinone process, makes jute cuttings and whole jute economically feasible as a raw material for pulp and paper.

Our pulp and paper industries are always in short supply of the conventional raw materials such as bamboo, bagasse and wood etc. This exceptional experiment will not only meet the demand of the paper industry but also earn huge amount of foreign exchange.

By exporting jute pulp, the imported long fibred pulp may be substituted and as a consequence the country may save a large amount of foreign exchange every year.

This dramatic diversification of jute has been made possible by the collaborative research of Bangladesh Chemical Industries Corporation (BCIC) and the paper industry. Chandraghona Paper Mills has already taken an initiative to produce jute pulp for paper, the January 27 issue of the Ruposhi Kaptia, a weekly, reports.

This timely initiative on the part of our Minister for Industries AM Zahiruddin Khan is a giant step towards technological advancement in the country. It will significantly improve the lot of our growers and contribute to environment protection and poverty alleviation, as Partex group has rightly appreciated the venture in a Bangladesh Observer advertisement.

But in the process of celebrating and rejoicing our technological breakthrough, the men behind the curtains were completely forgotten, a usual phenomenon in the area of innovation.

Whose idea and work was this? Who started the initial process that has now finally culminated into crowning success? "BCIC, in the 1980's sponsored a project of pulping

Scientists working at the Bangladesh Centre for Scientific and Industrial Research (BCSIR) laboratories making paper sheets out of jute pulp.

of jute sticks, jute cutting and jute fibre in the Bangladesh Centre for Scientific and Industrial Research (BCSIR) laboratories," reports a BCSIR senior official. "There in 1985-'86 BCIC and BCSIR started a joint project in this line," the official who requested anonymity says.

"It is a happy combination of financial help by BCIC and the scientific venture of BCSIR scientists. The joint venture of BCSIR and BCIC resulted in successful chemical jute conversion," the official continues.

This work has been going on in the lab for 30 years. The earch in 1988. This has been a lifetime work of Dr. Amirul Islam, Ex. member (dev.), BCSIR and Miah Zan Ali Khan, Ex. senior scientist, BCSIR.

Soda Anthroquinone process has been tried on wood but never on jute. The superiority of this process; yield of the pulp is increased, time for pulping is reduced, degradation of pulp is reduced, the cost of the paper is naturally reduced .

"Jute is now facing strong competition with synthetic fibre for its traditional use, and as a result, the demand for jute goods is declining in the world market," explains Dr Amirul Islam. "In the near future, we may not only lose our world market of jute, but also deprive ourselves from our cash crops. Therefore, it is the proper time to think over the alternative use of jute," he continues.

Jute is a good source of cellulose and its content is much higher than that of any other conventional raw materials, and so it can be a potential substitute in our paper industries, he believes.

The Soda Anthroquinone is economical and has been used on wood before but never on jute, which was first done by BCSIR. This process of production of pulp and paper has been leased out to A K Khan Group of Industries.

"A K Khan Group of which our Industries Minister AM Zahiruddin Khan is the Chairman, and which is owned by his brother Shamsuddin, purchased the right to produce pulp and paper from whole jute plant by soda anthroquinone process from BCSIR two years ago at a cost of Tk one lakh and one thousand. The company is supposed to go into production after BCSIR patent for the above process has been granted," says the BCSIR senior official.

All the research and laboratory works were tediously done by these two scientists Amirul Islam and Miah Zan Ali Khan at the BCSIR laboratories. Strangely their active role and BCSIR for that matter was never mentioned anywhere.

If the sponsored people can get into the limelight, then why not the real men behind. Without their effort the work and research would never reach the stage it has done now. "These scientist should get their due recognition. It was their lifetime work and achievement," says the BCSIR official.

Our Mineral Resources

by Lutfor Rahman

It is a good news for the people of Bangladesh that some international companies have signed the memorandum of understanding with the Govt. of Bangladesh for exploration of oil and gas in our country.

In the year 1974, when the people of Bangladesh has been facing a serious food crisis, an interesting news was published "Bangladesh has got huge deposit of oil which are going to be extracted in millions of barrels everyday". But for long time no news was heard about it.

Again in 1985, the then president Hossain Mohammad Ershad inaugurated the Horipur oil field in Sylhet and declared that Bangladesh would be one of the richest countries in the world very soon.

Nine years have passed but the destinies of the people have not been changed. Now we have to find out the reasons of failure of these projects.

So far the reasons for failure of those projects were (1) wrong selection of the foreign companies and (2) defects in terms and conditions of the agreements.

In 1991 our honourable Prime Minister formed a committee of seven members with the eminent scientists and journalists of the country to study the feasibility of the solid minerals found in Cox's Bazar sea beach and its nearest island. Honourable energy and mineral resource minister was the convenor of the committee. The committee inspected the spots and submitted the study report to the honourable Prime Minister.

A similar national committee for the mineral resources of Bangladesh can be formed by the Prime Minister taking the experts from the country. Those experts should have long experience and training abroad.

They should be sincere honest and dedicated to the welfare of the people of the country. The committee should select the foreign companies and take decisions on terms and conditions imposed on the foreign companies, before signing the final agreements.

Now we have a democratic govt. i.e. peoples govt and these minerals are peoples' too. So the govt. should be very much conscious about the interest of the common people.

PBX and Business

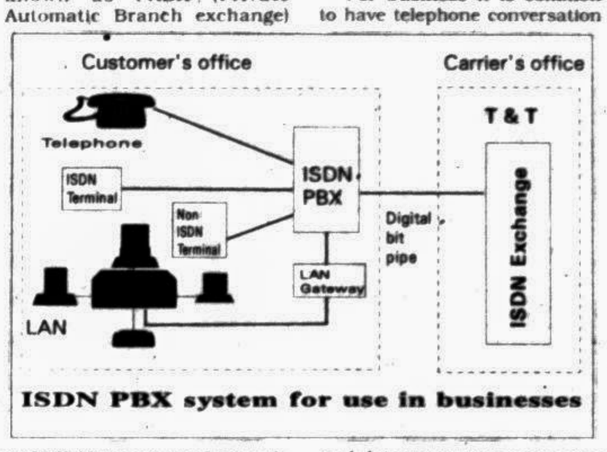
by Noor-A-Alam Chowdhury

THE public switched telephone network, were usually designed many years ago, with a goal in mind: transmitting the human voice in a more or less recognizable form. This system is proving inadequate for modern communication needs such as data transmission, facsimile, and video.

It is alright to have individual telephone line for each or a group of employees for a small business house. For large or a medium business house you cannot have effective in house or outside communication without Private Branch exchange (PBX).

Today's business communication no longer exists with voice; it now includes voice, data, and image. A sagacious PBX system can offer the economy and efficiency of voice, data, and image communication.

The modern PBX, also known as PABX, (Private Automatic Branch exchange)



ISDN PBX system for use in businesses

or CBX (Computerized Branch exchange), is a third-generation system. ,PBX design is a large and complex area, and much of the technology is proprietary, so you should be careful about the internal transmission system.

The heart of the PBX is circuit switch into which modules can be inserted. Each module card interfaces with some class of device and produces an ISDN (Integrated Services Digital Network) bit stream as output. ISDN has as its primary goal the integration of voice and nonvoice services.

The key service will continue to be voice, although many enhanced features will be added. One ISDN feature is telephones with multiple buttons for instant call setup to different telephones. Another feature is telephones display the caller's telephone number, name, and address on a display while ringing. A more sophisticated version of this feature allows the telephone to be connected to a computer, so the caller's database record is displayed on the screen as the call comes in.

The key idea behind ISDN is that of the digital bit pipe, a conceptual pipe between the customer and the carrier through which bit flow. Whether the bits originate from a digital telephone, a digital terminal, a digital facsimile machine, or some other device is irrelevant. All that matter is that bits can flow through the pipe in both directions. The digital bit pipe can, and normally does, support multiple independent channels by time division multiplexing of the bit stream.

For business it is common to have telephone conversation and data transmission going on simultaneously. So an ISDN PBX can provide the real interface for telephones, terminals, and other equipments. Calls between two telephones or terminals within the company, usually dialed using 4-digit extension numbers, are connected inside the PBX.

When an user dials '9' (or some other code) to get an outside line, the PBX allocates a channel on the outgoing digital bit pipe and connects the caller to it. If no channel is available, the caller gets a busy signal.

An ISDN PBX can directly interface to ISDN terminals and telephones. The third generation PBXes that speak not only ISDN, but also RS-232-c, RS-449, X.21, analog telephone, fiber optics; IBM PC bus, Ethernet, and anything else as per needs. The ISDN bit pipe supports multiple channels interlaveled by time division multiplexing. Several channel types are

A — 4 kHz analog telephone channel;

B — 64 kbps digital PCM;

C — 8 or 16 kbps digital channel;

D — 16 or 64 kbps digital channel for out-of-band signaling;

E — 64 kpbps digital channel for internal ISDN signaling;

H — 384, 1536, or 1920 kbps digital channel.

The ISDN bit streams can be used to support either circuit switching or packet switching, depending on how busy the traffic is. In the circuit switching scenario, the ISDN customer calls up the destination and uses a 64-kbps channel as a physical layer connection for digitized voice, data, or anything else. The entire 64-kpbs is dedicated to the call throughout its duration. The charge will typically be proportional to the duration of the call, but not to the volume of data sent. Business users can even the bill to the individual.

Data communications became important with the expansion of the use of computers. ISDN PBX have continued to develop into a major industry providing the interconnection of computer peripherals and transmission of data between distant sites. The value of this communication techniques derives from the ability to construct unique codes to represent different item of information. These information are the language of today's business which have revolutionized business decision making process.

Even though technology has been on the scene for only a relatively short period of time, it is difficult to remember how business conducted prior to computers and peripherals. ISDN has become so commonplace in today's business that few fields of endeavor remain for which data processing is not important or even essenual. ISDN is of particular importance when information is to be gathered, stored, retrieved and evaluated. ISDN is used so widely because it provides economical and efficiency in rapid manipulation of data.

Contributor is working in Ciba-Geigy (Bangladesh) Limited with IT responsibility.

Star Special — Computer

Lasing at the limits

THE first lasers were bulky affairs, laboratory oddities fashioned from rods of ruby. Today they can be small enough to lose under a fingernail. Their range of applications has grown as their dimensions have shrunk. Now new ways of mass-producing semiconductor lasers are emerging from laboratories, which will allow lasers to shrink in size and grow in possibilities yet again. But this may be the last time. Lasers cannot get much smaller without running foul of the laws of light.

Despite their outward diversity, lasers all work on the same principle. The laser material — the ruby, the helium and neon, the semiconductor, or what have you — is pumped full of energy, and the electrons inside it get excited. As they get over their excitement, they shed energy in discrete bursts of light. The trick to making a successful laser is to co-ordinate the bursts. It is all done with mirrors.

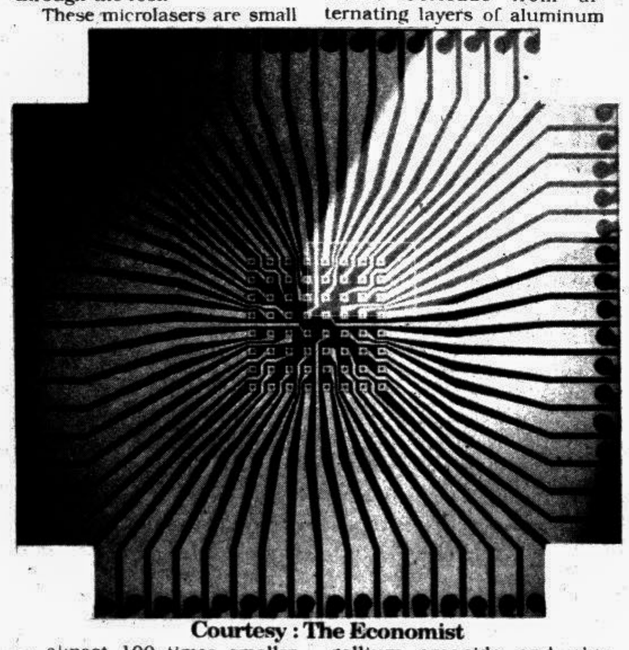
Put mirrors around a laser material, and a few light waves will be trapped between them, bouncing repeatedly back and forth. When one of them encounters an electron that has been pumped into an excited state, it will trigger the release of the election's stored energy in the form of another identical light wave. The two waves travel on in synchrony, with their crests and troughs neatly aligned, recruiting more light from other electrons as they go. Make one of the mirrors slightly transparent and a beam will emerge ready to do useful work.

Crystals of semiconducting materials can be made to do this quite nicely. The most commonly used is gallium arsenide. It is cut into crystals about 0.1 millimeters long; these have electrical contacts on the top and the bottom, with the lasing layer sandwiched in the middle. The edges of the crystal make pretty good mirrors for light bouncing around inside. The cheap little lasers in CD players and computer printers are built around such domino-shaped slivers of semiconductor producing infra-red light from one of their short ends.

Though widely used — Laser Focus World, a trade journal, expects the world-wide market to exceed $ 250m this year — these lasers-in-a-chip have shortcomings. Each chip has to be broken off a block of semiconductor like a chunk from a chocolate bar, which is troublesome; then each has to be tested. And the flat edges provide not beams of light, but spreading fans, which have to be focused with lenses.

The new "vertical cavity surface-emitting lasers", or microlasers, could avoid these problems. They are like many-storied skyscrapers with the lasing area about half way up. The layers of semiconductor above and below this lasing material act as partial mirrors, so that the light is reflected up and down the tower. The floors below the lasing material reflect more than those above it, so some of the light bursts through the roof.

These microlasers are small



Courtesy : The Economist

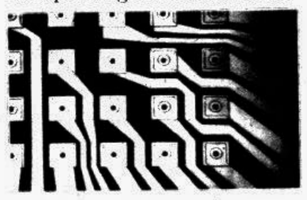
— almost 100 times smaller than edge-emitting lasers. Lots of energy passing through a small structure causes heat which causes problems. The most powerful microlasers often work only in short bursts, and require expensive cooling. For now they shine in research laboratories, not factories, offices or homes. However, such difficulties have been overcome before. When they are, everyday lasers may go from being made of semiconductors to being etched on to their surfaces, just as transistors did in the dawn of the computer revolution. That is one reason the world's electronic giants are keeping a sharp eye on the field.

The microlaser has charms other than its size. A microlaser beam comes out of its column reasonably straight and narrow. This allows it to be fed directly to an optical fibre without the need for lenses to focus it, which could be a decisive advantage for microlasers in communications.

Another advantage is that microlasers are made as two-dimensional arrays — cities of skyscrapers. All the lasers on an array can be tested at once. The array of 64 lasers shown in the photograph was made by Photonies Research of Longmont, Colorado from alternating layers of aluminum gallium arsenide and aluminium arsenide. The positions of the lasers were marked on the chip using ultraviolet light, then the gaps in between them were impregnated with protons to stop them conducting electricity, thus isolating each laser tower from its neighbour. This is standard stuff for those who make computer chips.

These two-dimensional arrays promise intriguing applicatfons. Rows of lasers in an array could be used for high-speed, high-resolution laser printing. Chips for image-processing could be made with an array of light detectors on top of a layer of electronics on top of an array of lasers. One image shines in and another shines out; all the dots are processed at the same time, rather than in sequence, as they would be with conventional chips.

This would be a step on the road from electronic to optical computing. It may not be a road worth travelling to its end. Light waves, always on the move and unwilling to interact with other light waves, may prove to be poor at storing or manipulating data. Those same



properties, on the other hand, make light especially good at shuttling data from place to place. The halfway-house computers of the future may well use light to connect their electronic processors — and microlasers would be a particularly suitable source for it.

Arrays could also be used to project displays. The microlaser arrays are so small and light that they could easily be built into a pilot's helmet and used to project images on to his visor — or on to the inside of a pair of dark glasses, or even directly on to the retina. Partly for this reason, researchers are trying to produce microlasers that emit shorter-wavelength visible light, rather than invisible infra-red. Earlier this year Richard Schneider and James Lott of the Sandia National Laboratories in Albuquerque, New Mexico, announced that they had produced a microlaser that emits red light, close to the wavelength of the beams given off by the lasers used in bar-code scanners. But that is about as far as gallium arsenide can go.

Nobody knows how fast future progress into the green and blue parts of the spectrum will be; it will require building microlasers out of completely different semiconductors. This is one of the areas in which microlasers show their immaturity compared with edge-emitting lasers, which thanks to the use of other semiconductors already span the whole rainbow of colours. Meanwhile, other scientists are trying to stretch the light; fibre-optic links work best with longer-wavelength microwave radiation. Kenichi Iga at the Tokyo Institute of Technology, the founding-father of the field, recently reported versions which work at these wavelengths.

What about the lengths of the lasers, as opposed to the light they produce? The smallest microlasers are not very much bigger than the wavelengths of the light they emit. That makes it possible for odd aspects of quantum physics to come into effect. One result is that the size and shape of the laser can influence the type of light given off. In all lasers, some of the excited electrons release their energy spontaneously before meeting with one of the toing-and-froing synchronizing light waves. This spontaneous emission is usually lost through the side of the laser and causes a portion of the lasers power to be wasted. An appropriately designed and sufficiently small microlaser could, however, inhibit this type of emission; its very shape would force the light into the desired wavelength.

It may or may not be practical to exploit such effects, but a lot of scientists expect to have fun studying them. In the end, though, their studies will bump up against of final limit — a laser that is tiny enough to inhibit its own laser light.

AST Sales Increase 95 pc

AST Research Inc. (ASTA-NASDAQ) announced record revenues of 677 million dollar for the second quarter ended January 1, 1994. Second quarter revenues increased 95 per cent over the comparable prior year period and 32 per cent over the immediately preceding quarter, says a company press release.

Fiscal year 1994 second quarter net income was 17.9 million dollars, versus 14.6 million dollars for the prior year period. Earnings per share were 54 cents for the second quarter of fiscal year 1994 as compared to the prior year second quarter earnings per share of 46 cents.

"To illustrate our rapid growth, this quarter's revenues topped those achieved for the entire 1991 fiscal year," said Safi Qureshey, AST chairman and chief executive officer. 'vigorous sales and unit volume momentum has propelled AST into the top five largest PC companies in the world."

New BallPoint: Better Feel, Better Software

The $125 Microsoft BallPoint Mouse, Version 2.0, is a huge improvement over the original. Its design is much more comfortable, the trackball is easy to control, the serial connector is gone, and the software includes a variety of smart utilities. But with built-in pointing devices — especially front-and-center trackballs — popping up on more and more notebook PCs, you have to wonder, is the new BallPoint Mouse dead on arrival?

The answer is no. The control you get with the new ergonomically designed BallPoint is far superior to that of most built-in trackballs. Two mouse buttons run almost the entire length of either side and are sculpted to fit your finger. If you happen to love front-and-center designs, a third button forms a semicircle around the trackball, making it easy to point and click with just your thumb. The BallPoint Mouse's trackball itself is heavier, smoother, and more resistant than before to give you better control over the cursor.

The serial adapter has been replaced by a PS/2 adapter, so you never have to chose between giving up your serial port and attaching an extra serial-to-PS/2 adapter. The mounting device is designed to attach to your notebook's keyboard and never come off. Now when you pack up your notebook, you can simply snap off the BallPoint Mouse, leaving the attachment clip in place (it adds less than an inch to the notebook's width), and close the case. Be warned, though:

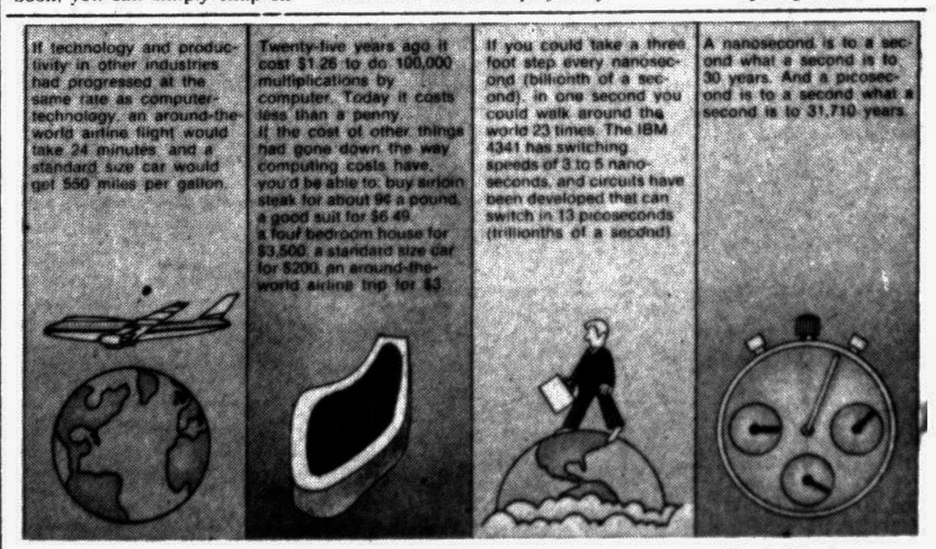
The BallPoint is so securely attached to its mounting device that snapping it off can feel more like breaking it.

Version 9.01 of the Ball Point software includes new utilities that make it easier to use your cursor on LCD screens. Snap-to makes the cursor jump to the default button when you open a dialog box; when you've lost sight of the cursor, Locate helps you by placing it in the center of the screen; and Screen Wrap makes the cursor go to the opposite side of the screen when you move it off one side.

Mouse trails can be enabled, but only with standard Windows EGA, VGA, or Super VGA drivers, and the cursor can be made to appear in three sizes and three colours. There's even a Magnify option that turns the cursor into a magnifying glass for reading hard-to-see parts of the screen. Users of the original BallPoint can upgrade to the new software for $19.95.

•List price: Microsoft BallPoint Mouse, Version 2.0, $125.

— by Nipon, *Dhaka.*



The impact of technology

Courtesy : Tani, *Thakurgaon*