LEATHER FROM ANOTHER ERA

In the Hazaribagh district of Dhaka, Bangladesh, **ARCHAIC TANNERIES** put workers and the environment at risk

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LIFE IS ABOUT TO CHANGE in Hazaribagh, the old tannery district of Dhaka, Bangladesh’s capital. Within two years—if the scenario currently envisaged pans out—the district’s 206 leather tanneries will either shut their doors or move to a different part of the city. Once relocated, their effluent will be treated and their workers will operate in far safer conditions. Some 30,000 workers and much equipment will move.

A way of life will disappear in Hazaribagh, but no one is complaining. The district’s tanneries belong to a long-gone era. They dump their untreated waste into drains and ditches that lead to the Buriganga River, the main river flowing through Dhaka. Workers handle corrosive chemicals without protective gear and walk around the tanneries barefoot.

The homes of tannery workers in Hazaribagh are built next to contaminated streams, ponds, and canals. The air is polluted by informal leather recyclers who burn scraps of leather to produce cooking oil, soap ingredients, chicken feed, and glue. The bustling commercial, residential, and university district of Dhanmondi is nearby but seems a world away.

“Hazaribagh is probably one of the worst places I have been to in the region,” says Jürgen Hackenbroich, Asia-Pacific director of leather chemicals for the German chemical company Lanxess. “Hazaribagh reminds you in some ways of the Middle Ages, or perhaps the Stone Age.” Lanxess is one of five major international manufacturers of leather-processing chemicals, along with BASF, Clariant, Stahl, and TFL.

Although Hazaribagh seems to belong to a different time, it is in fact very much part of the global leather industry. Bangladesh exports about $250 million worth of leather and about $170 million worth of footwear annually—significant amounts, although small compared with some other countries. Most of Bangladesh’s tanneries are in Hazaribagh.

Leather made in the district is shipped for further processing in the U.S., Europe, and other parts of the world. The chemicals that leather tanneries in Hazaribagh use are made abroad, and foreign pressure is part of the reason that the tanneries have promised to move and upgrade. The European Commission, for example, is considering banning the import of leather made in Hazaribagh.

The need to change things is urgent. “Water treatment is absolutely needed,” says Mosharraf Ali, a production engineer at Hazaribagh’s Royal Tannery, as he points to contaminated water flowing out of a machine that squeezes partially processed leather to dry and smooth it. Ali says the water will end up in the Buriganga without any treatment.

Moreover, Ali’s staff at Royal Tannery

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works in primitive conditions that are the hallmark of Hazaribagh’s tanneries. They use almost no protective gear. Some are equipped with rubber gloves and boots, but others walk around barefoot while handling leather, process chemicals, and machinery with bare hands. No one wears a mask or goggles, and there are no safety fountains for eye-washing.

**MAKING LEATHER** requires a wide range of process chemicals that are potentially harmful to plant workers, the environment, and the public. The chemicals also account for a substantial portion of the tanneries’ manufacturing costs. Lanxess’ Hackenbroich estimates that raw animal hides account for up to 70% of a tannery’s total operating cost. About 10% is spent on chemicals, he figures, and the rest on salaries, utilities, and other expenses.

Leather-processing chemicals turn an animal skin that would putrefy if untreated into an attractive and long-lasting piece of clothing, footwear, or seat covering. The list of chemicals used in the early stages of processing a skin includes lime, sodium sulfide, sulfuric acid, sodium hydrosulfite, caustic soda, arsenic sulfide, and calcium hydrosulfite.

Next, chromium-based chemicals are used for chrome tanning, a widely used process for turning a skin into bluish-white-colored leather that can be stored for a long time. At the finishing stage, tanners use dyes and various finishing agents to improve the characteristics of their leather.

In most of the world, tanners treat their liquid effluents before releasing them into the environment. Andy Pleatman, the owner of the Asiatan tannery in the southern Chinese city of Jiangmen, says China, the world’s largest producer of leather, has made enormous progress over the past three years in cleaning up its industry.

Big users of leather such as Timberland and Nike no longer find it acceptable that their leather suppliers simply comply with the laws of the country in which they operate, Pleatman explains. Major shoe companies increasingly demand that tanneries clean their effluent and ensure the safety of their workers to Western standards. “China has absolutely cleaned up its leather industry,” he claims.

A visit to Asiatan reveals that it owns and operates a large water treatment plant. In addition to removing particles and heavy metals, Asiatan’s effluent treatment facility lowers the chemical oxygen demand of water before release.

By contrast, Hazaribagh is the most polluted area of Dhaka, according to a paper published in the December issue of the Bangladesh Journal of Scientific Research (2008, 21, 51). The authors—Sohana Shaban, S. M. Imamul Huq, and Shafiqu Rahman, three academics at the University of Dhaka—report that the water around Hazaribagh is far more polluted than in other parts of Bangladesh where tanneries treat their effluent before release. “I don’t want to dramatize, but Hazaribagh is definitely one of the most polluted places in Bangladesh,” says Huq, who chairs the university’s department of soil, water, and environment.

The tanneries are not the only source of pollution in Hazaribagh. Everywhere in the district, backyard mom-and-pop operations collect tannery refuse to make other products. Some of these marginal operators make cooking oil from the residues of meat and fat that are discarded when animal skins are turned into leather. “Don’t eat street food in Bangladesh,” Huq warns.

Other operators make chicken feed and glue by boiling leather residues. And in a garbage dump next to a canal that carries untreated tannery effluents into the Buriganga, a 40-year-old Lurul Houda extracts animal oil from tannery scraps and sells it to small-scale soap manufacturers. Houda and other recyclers typically use finished leather scraps as fuel to boil other types of tannery refuse. They dump their waste into the canals. Young children near Houda’s workshop pick through solid waste from households and tanneries.

On hearing of the Bangladeshi practice of recycling leather industry waste into cooking oil and animal feed, Cai Guise-Richardson, a Charles C. Price Fellow at the Chemical Heritage Foundation who has researched the history of the leather industry, is surprised. “Heavy metals could be entering the human diet through this route,” she observes.

The effects of working in a tannery without basic safety gear are not always obvious. For example, Fazan Ahmed, a 70-year-old worker at the M. A. Samad tannery, moves around barefoot while he handles leather that has just been rinsed to remove excess process chemicals. Ahmed’s feet show no signs of damage, even though Ahmed started working in a tannery when he was only 10 years old, according to floor supervisor M. D. Shirag.

But Ahmed’s apparent health provides a misleading picture of how dangerous it is to work in a tannery. It’s “a really bad idea” to walk around barefoot on a tannery’s wet floor, Guise-Richardson tells C&EN. “Chrome always leaves some residue that is still active,” she says. She warns that
diluting the chrome by rinsing it with water is far from enough to make nonfinished leather safe to handle without gloves.

And damage to workers’ health develops slowly over time, says Abdul Maleque, general secretary of the Hazaribagh chapter of the Bangladesh Trade Union Centre. “We have lots of cases of skin diseases, jaundice, dysentery, asthma, and gastric ulcers,” he says.

The unions have demanded for decades that tannery workers be equipped with some safety equipment, Maleque says. One of the problems, he says, is that owners can get away with providing small salary increases to take care of most staff grievances. Dhaka University’s Huq confirms that tannery workers earn more than garment workers, who operate in safer conditions.

On the other hand, major leather chemical producers claim that their products are mostly harmless. M. A. Sattar, senior manager of leather industry products in BASF’s performance chemicals group, says the line of leather chemicals his company has developed is safe both to the environment and to factory workers. “Our products are clean, and they’re highly prized,” he says.

BASF’s R&D efforts have yielded leather-processing chemicals that are free of harmful substances such as chromium(VI), Sattar notes. Chromium(VI), or hexavalent chromium, is used in a wide range of industries even though it is highly toxic. BASF’s chrome tanning salts are instead based on the more benign chromium(III), an essential nutrient that is available as the nutritional supplement chromium picolinate.

BASF has also come up with a line of leather detergents that are free of alkylphenol ethoxylates (APEOs), surfactants that are suspected of being endocrine disruptors. “We sell only detergents that are APEO-free,” Sattar says.

BASF’s leather chemicals are also formaldehyde-free, says Saria Sadique, BASF’s managing director in Bangladesh. All customers get material safety data sheets and certificates of analysis. Moreover, he says, the company educates its customers “about the safe use of the products, how they can actually minimize the risk of potential hazards of the product.”

As demand for socially responsible leather grows, Sadique adds, there is not only an ethical need but also a commercial need for leather chemical companies to come up with less harmful products. “It takes a lot of money to develop these products,” he says. “But in the next few years, global retailers like Puma, Marks & Spencer, and so on will probably buy only from those suppliers who can offer products that are less damaging to the environment.”

Leather tanning has been a source of problems for centuries, Guise-Richardson notes. “Before 1900, bark-tanning contributed significantly to deforestation.” She says that long before the industrial age, dung and urine were used in the processing of animal skins into leather.

Lanxess’ Hackenbroich says the big five leather chemical suppliers supply only products that are safe to workers and the environment. But he notes that they are not the main suppliers in Bangladesh of the basic commodity chemicals—including sulfuric acid and caustic soda—used in the initial stages of processing animal hides. Those chemicals usually come from Indian and Chinese manufacturers.

Leather chemicals need to be used properly, regardless of their origin, Hackenbroich adds. “You may have products that cause eye irritation if you open the drum; if you stir the drum; or if the product spills over the drum, falls, and you get splashed in your eyes,” he says. At present, he believes, only a minority of Hazaribagh’s tanneries are meticulous enough to use chemicals in such a way that they have a benign impact on workers and the environment.

INDUSTRY WATCHERS expect Hazaribagh’s safety and environmental problems to sort themselves out by 2010, when the tanneries move to Savar, a mostly vacant area in the northwest of Dhaka, about 20 miles from Hazaribagh and on the other side of the city. Whereas crowded Hazaribagh has no room for effluent treatment plants, such facilities will be at the heart of the proposed leather industry zone. Moreover, tanneries will take advantage of the relocation to introduce a comprehensive range of safety equipment.

“The tanners will move because they have to,” Dhaka University’s Huq says, explaining that the political will now exists to make it happen. At the end of December, Bangladesh held peaceful national elections that gave power to Prime Minister Sheikh Hasina Wazed of the Awami League. For the two preceding years, a caretaker military government ran the country. Before that, politically motivated riots were common and impaired the government’s ability to get things done.

To encourage the tanneries to move, the Bangladesh Environmental Lawyers Association (BELA) filed a public interest lawsuit in 2003 that is still pending in the High Court in Dhaka. M. Iqbal Kabir, a BELA lawyer, contends that the relocation of the tanneries has been delayed too many times over the years. Since independence in 1971, “we’ve been told that the tanneries will move,” he says. “We filed this case to make sure it happens.”

If BELA wins, Kabir adds, the tanneries will be legally forced to relocate and to treat their used water before releasing it.

The Hazaribagh tannery district wasn’t always so close to the center of Dhaka, according to M. A. Majed, an executive director with Apex Tannery Group, one of Bangladesh’s main exporters of leather products. The first tanneries were set up in the area in the 1950s, he says, when Dhaka was a far less populated city and Hazaribagh

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was deserted. “No one ever bothered about pollution back then,” he says. Although some funding considerations are getting in the way of immediate action, he agrees that the tanneries should in principle move without delay.

Commercial imperatives are another reason to expect that the tanneries will relocate. Foreign buyers are increasingly demanding that Bangladesh’s tanneries start operating in a more socially responsible manner, Majed says. German buyers in particular have given Hazaribagh-based tanneries a deadline to upgrade their operations. Majed notes that Apex operates another tannery near Dhaka that meets world standards.

Despite the widespread expectation that the move will happen, some in the industry doubt it will take place as early as 2010. Muhammad Abdul Hai, general secretary of the Bangladesh Tannery Association, says the cost of relocating will be so high that many tanneries will close rather than relocate. BASF’s Sadique expects that only about 60 of the 206 tanneries will actually move.

**THE MAIN PROBLEM** is that tanneries make use of heavy rotating drums that are so sturdily anchored into the ground that they are practically unmovable, Apex’ Majed explains. Without government assistance, he says, the move to Savar will not be financially viable.

Dhirendra Kumar Saha, deputy secretary of the Bangladesh Finished Leather, Leathersgoods & Footwear Exporters’ Association, says tanneries have asked the government for a $35 million subsidy to facilitate their move.

Lanxess’ Hackenbroich points out that relocating makes little business sense for tannery owners. Many Chinese tanneries lost their competitiveness after being forced by their government to shape up their safety and environmental practices, he notes.

“If the tanneries can continue working under primitive conditions in Hazaribagh with no water treatment, of course you have lower costs and you always have a global cost advantage over other tanneries in other countries that have to comply with all sorts of environmental regulations,” he says. “Why should you move to this clean new place and put your costs out of control?” Hackenbroich argues that only a firm government deadline will force the tanneries to move and raise their operating standards.

The chemical industry can’t do much more to encourage the tanneries to improve their environmental and safety practices, Hackenbroich maintains. The big five leather chemical suppliers can coax tanneries to switch to safer, more environmentally friendly chemicals that would enable them to sell socially responsible leather at a higher price, he says. But they cannot threaten to stop supplying chemicals if nothing is done.

“Other chemical suppliers from countries like India, South Korea, or Japan would take advantage of our decision,” Hackenbroich says. “Our Responsible Care understanding is limited to our products, limited to any harm our products could have on workers who are applying our products, but certainly not to how the effluents are being treated in the tanneries.”

Mohammed Abdul Maleque, chief executive officer of the Bangladesh Leather Service Center in Hazaribagh, says efforts by leather buyers to improve environmental and safety standards at the tanneries are actually fairly tepid. He notes that Italian companies, which are the main purchasers of Bangladeshi leather, are not insisting strongly on improvements.

“The European Commission is starting to ban the import of leather from Hazaribagh, but the pressure from Italy could be much higher,” he contends. Maleque, who was a senior executive at shoe manufacturer Bata before joining the Leather Service Center, says Italian firms buy unfinished leather from Bangladesh, finish it in Italy, and “then sell it to all the big brands.”

Interestingly, the center is largely funded by the Italian government with the goal of reducing the amount of toxic materials local tanneries use. The Leather Service Center is setting up the first lab in Bangladesh capable of certifying that leather products are free of substances that could harm consumers.

Italians, Maleque says, are interested in “raising the quality level of Bangladeshi leather,” even if they are not overly concerned about conditions in Hazaribagh.

“Our focus is not on improving the lives of workers, but our certifications will cause workers to handle fewer hazardous substances,” he notes.

A small global player, Bangladesh can do a lot more with its tanneries. According to a background paper produced by the leather exporters’ association, the country is endowed with an abundance of raw hides and cheap labor. Once the tanneries relocate to Savar and embrace socially responsible practices, the association predicts, sales of leather, finished footwear, and other leather items will triple. It expects more footwear manufacturers will set up plants in Bangladesh to take advantage of its leather and abundant labor force.

Even in Bangladesh, reckless contamination of a major city cannot go on forever. Although it is happening slowly, the relocation of Hazaribagh’s tanneries is inevitable. It will mean the end of a way of life in the old tannery district, but it will be a much overdue change for the better.
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