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Elena Agarkova is studying management of natural resources and the relationship between Siberia's natural riches and its people. Previously, Elena was a Legal Fellow at the University of Washington's School of Law, at the Berman Environmental Law Clinic. She has clerked for Honorable Cynthia M. Rufe of the federal district court in Philadelphia, and has practiced commercial litigation at the New York office of Milbank, Tweed, Hadley & McCloy LLP. Elena was born in Moscow, Russia, and has volunteered for environmental non-profits in the Lake Baikal region of Siberia. She graduated from Georgetown University Law Center in 2001, and has received a bachelor's degree in political science from Barnard College.

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The Crane-Rogers Foundation
4545 42nd St. NW, Ste 311
Washington, D.C. 20016

Tel: 202-364-4068
Fax: 202-364-0498
E-mail: icwa@icwa.org
Web: www.icwa.org

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From Lenin and Marx to Toilet Paper and Egg Cartons, or the Siberian King of *Makulatura*

By Elena Agarkova

The white van came to a stop at the corner of Karl Marx Street right after passing me. I closed my cell phone and walked up to slide the door open. It was 14 minutes after 7:00, on a frigid morning in Irkutsk. Light snow was falling, and I hoped I would not have to wait too long. Mikhail Prokopievich told me the day before that they pass down this street between 7:12 and 7:24. That had to be him.

There were three or four people inside already. I said hello and one of the two men in the front, the one wearing a big fur hat, introduced himself. "I am Mikhail Prokopievich." The van sped off into the still-dark city, picking up more people along the way. Forty-five minutes later we arrived at Vtorma Baikal's factory on the outskirts of Irkutsk, in the semi-industrial Novo-Lenino neighborhood. I came here to find out how one runs a business making recycled toilet paper.

Vtorma Baikal shares the street with other waste processors, handling everything from metals to ash, but it is the largest and the oldest paper recycling business in the region. "Vtorma" stands for an abbreviation of two words, *vtorichnaya*, or "secondary" (a word that came to mean recyclable resources in Russian), and *makulatura*, or discarded paper and carton. Mikhail Prokopievich Chernorubashkin, now in his 70s, has been its director for more than 40 years. He led Vtorma through several incarnations, from a Soviet state-controlled paper-collecting agency, to its current status as a private recycling processor and manufacturer. Mikhail Prokopievich is a legend around here. When I started talking to people in recycling business in Irkutsk, almost everyone, from other businessmen to government officials, asked me whether I had met Chernorubashkin yet. "You have

to talk to him, he is an incredibly charismatic character who has lots of great ideas," said one "semi-legal" plastics processor.

I thought it fitting that our first encounter happened in the van that does daily pickups of Vtorma workers around Irkutsk. The same van returns workers from the first shift back to the city in the afternoon. The factory has a problem finding reliable employees and holds on to those it already has. "Almost everyone around this neighborhood drinks too much," said Mikhail Prokopievich as he opened the heavy front door of Vtorma's three-story office building for me. "We have to get workers from as far as the villages around Irkutsk now." Other problems became apparent as we walked to Chernorubashkin's office. He has been forced to rent two of the three floors to another company, to pay ever-increasing heating, electricity, and transportation bills. All of these services used to be subsidized by the government in Soviet times. Not any more — in the new economy former state agencies became ruthless moneymaking machines that use monopoly power to extract profits from their customers. "It used to be that the railroad tariff constituted 0.001 percent of our production cost. Now transport and electricity cost up to 10 percent. We pay 350 thousand rubles a month for electricity. The railroad tariff used to be 1,000 rubles per ton; now it's 150 thousand rubles." Mikhail Prokopievich gestured to the industrial landscape outside his window. "Before Yesipovskiy [the previous governor of Irkutsk, who governed for less than a year until dying in a helicopter crash last May, during what many suspected to be an illegal hunting trip] a square meter cost 68 rubles here. Now it costs 628 rubles." He explained that regional bureaucrats are personally interested in raising the land tax.



One of the old news articles about Mikhail Prokopyevich, titled "The Toilet King of Near-Angariye," from his personal collection.

"It stays in the local budget." Mikhail Prokopyevich kept running through the numbers, which meant one thing to him: "The state is incapable of governing."

He remained an enthusiast of the extensive system for collecting and utilizing "secondary resources" (the Russian term for recyclable waste) that existed in the Soviet Union and even prior to that. "Peter the Great issued a decree ordering traveling salesmen to collect old rags, to be recycled into paper products. After WWII men drove around the country on horses, collecting rags and paper." Mikhail Prokopyevich knows his history. As early as 1715 Peter the Great issued a decree mandating use of waste from fabric and rope manufacturing for paper production. Five years later he issued two more decrees, ordering collection of old paper, to be transferred for recycling to paper mills in Russia and Holland, and collection of rags from inhabitants of St. Petersburg and Moscow, "for the paper business." The tsar, who set out to "westernize" backward Russia, worked tirelessly to create industrial manufacturing almost from scratch in a heavily agrarian country, importing foreign specialists, subsidizing talented Russian businessmen, and lending a hand himself occasionally. He studied ship carpentry and had a passion for building ships. His paper mills in St. Petersburg even utilized fleet

waste: remnants of sail cloth, sacks, used boat sails, sailors' bedding, and parchment leftovers.

But Peter the Great merely followed a 2,000-plus-year-old tradition. Paper as most of us know it — paper made out of virgin trees, or wood cellulose — has existed for a very brief time in human history, only since the second half of the 19th century. What came as a surprise to me was the fact that until then most paper came from materials that today we would call recycled.

A historical detour: some scholars believe that the word paper derives from the Greek term for *papyrus*, writing material that ancient Egyptians began making from a grass-like aquatic plant called *Cyperus papyrus* more than 4,000 years ago.¹ However, neither papyrus nor rice paper classify as true paper, or thin sheets made from macerated, intertwined fiber.²

Papyrus, on the other hand, comes from woody stems of *Cyperus papyrus*, cut or sliced end to end, and pasted together in a manner similar to laminated wood. Rice paper is not true paper either because it's made out of strips cut from the inner pith of the rice paper tree, a small shrub widely cultivated in China and Japan. And until the 15th century Europeans preferred an entirely different writing material to paper: animal skins. When Gutenberg printed his first Bible in 1456, most manuscripts were still made from parchment (specially prepared, or scraped, skin of a sheep or goat) or vellum (scraped calfskin). Apparently, you needed skins of 300 calves to print one copy of Gutenberg's Bible. No wonder reading remained an activity for the elite few.³

The immediate predecessor to modern paper dates back almost 2,000 years (even though there is some evidence for paper being used even before this date). We do know for sure that in AD 105 a Han court official, eunuch Ts'ai Lun, officially presented paper, made from macerated vegetable fiber, to the Chinese Royal Court. Ts'ai Lun used discarded cloth, tree bark, "well prepared" hemp and perhaps even old fishing nets, becoming the first official producer of recycled paper. The invention made its way to Japan *via* Korea, then part of China, 500 years later. His-

1 The Egyptian word *papyrus*, meaning "that of the king," may indicate that the Pharaoh had a monopoly on writing materials.
 2 "Once fiber has been macerated until each individual filament is a separate unit, the fibers are intermixed with water. Using a sieve-like screen, the fibers are lifted from the water, leaving a sheet of matted fiber on the screen. This thin layer of intertwined fiber is paper." Hunter, Dard. 1978. *Papermaking: the history and technique of an ancient craft* (New York: Dover. Original edition, New York: Alfred A. Knopf. 1947).
 3 No one knows exactly how many copies of the Bible were printed, but scholars believe the total to be around 180, with about 135-145 on paper and the rest on the more luxurious and expensive vellum. A single complete copy of the Gutenberg Bible has 1,272 pages; with 4 pages per folio-sheet, 318 sheets of paper are required per copy. The copies printed on vellum required 11,130 sheets.

torians report that Japanese Empress Shotoku sponsored, and perhaps even invented, the first original printing.⁴

The Chinese continued to make paper out of disintegrating cloth, tree bark, and plants, such as mulberry, hemp, and China grass. Marco Polo, in one of the first descriptions of Chinese papermaking (and paper money), wrote that Chinese emperors jealously guarded the secrets of papermaking. He also noted that fine paper was manufactured from vegetable fiber, such as rice or tea straw, bamboo canes, and hemp rag cloth. Many papermaking scholars state that the art of making paper spread to the Arab world only by the eighth century, after the Chinese lost the Battle of Talas, near Samarkand, in 751. Apparently, Chinese prisoners of war included skilled papermakers. They soon began manufacturing paper in Samarkand, a great location for papermaking because it had an abundant supply of hemp, flax and pure water.⁵ The art then spread through the Middle East, to Damascus, Egypt, and Morocco. In any event, papermaking came to Europe only in 12th century with the Moorish conquest of Spain and Sicily.

By the end of the 10th century, paper had replaced parchment and papyrus in the Arab world. The Arabs improved the art of papermaking by relying on linen as their primary paper material (Central Asian valleys supplied flax in large quantities). They also used rags and, as the demand grew, supplemented with any suitable vegetable fiber.

By the 11th century, Japanese papermakers recycled used wastepaper, re-pulping old documents to produce new paper sold in paper shops. This recycled paper, even though grayish in appearance was in much demand. Most likely the Japanese learned this technique from the more-advanced Chinese papermakers.

As for Europe, even though several European manuscripts written on Arab-style paper survive from as early as 1102, European papermaking did not take off until the 15th century. The Church initially banned the use of "Moslem" paper as a pagan art.⁶ Perhaps the wealthy landown-

ers who provided animal skins for writing created their own anti-paper lobby, but at that time paper also cost more than vellum and was more fragile than parchment. The demand for paper became greater only with the advent of printing in the middle of the 15th century. By the 16th century paper mills using old cloth rags began appearing all over Europe. Linen served as the predominant source of material for paper, supplemented by cotton, as Europeans began to recycle cotton rags.⁷

Dutch papermaker William Rittenhouse jumpstarted the American paper industry in 1690, when he built the first paper mill near Philadelphia. Rittenhouse's mill also made paper from old rags. Peddlers traveled the New England states regularly, buying old cotton rags from people's homes for the paper industry. Since recycled rags remained virtually the only source of papermaking fiber in the Western world for over 700 years, they were a sought-after commodity. Peter the First's traveling salesmen supplied not only Russian paper mills (of which there was just a handful) with rags, but also exported this valuable trash to Holland.

As papermaking spread, and the demand for paper increased, resulting rag shortages led to an intensive search for alternative sources of papermaking fiber.⁸ Wood and cotton competed for some time, as researchers tried to determine the best fiber source. Wood pulp is not a perfect source — wood fiber is not as strong as cotton fiber. Wood fiber also requires more processing with caustic chemicals to free its cellulosic components for papermaking.⁹ Furthermore, cellulose, the material that can be made into paper, comprises less than 50 percent of wood, much less than cotton (at 91 percent, almost pure cellulose) and linen (70-80 percent). However, in the end proponents of wood pulp won, the vast forests that covered the United States at the time being one of the reasons of their success. Wood pulp paper began to replace rag paper by the 1860's, after the introduction of wood grinders.¹⁰ The first ground wood pulp mill in the United States was established in 1867 in Massachusetts. Mechanized production of paper from wood cellulose took off, and paper, a rare and precious commodity until then, began to be produced in mass

4 Hunter, *Papermaking*.

5 However, some Central Asian historians believe that Arabs had been making paper out of cotton even prior to 751.

6 In 1231 Frederick II, the Holy Roman Emperor, declared all official documents written on paper to be invalid.

7 In 1666 a decree came out in England prohibiting the use of linen and cotton for burial of the dead (only wool could be used for this purpose), to save these materials for the papermakers. England saved 200,000 pounds of linen and cotton annually as a result.

8 On April 28, 1800, English papermaker Matthias Koops applied for the first patent for recycling paper, "for a mode of extracting printing and writing ink from printed and written paper, and converting the paper from which the ink is extracted into pulp, and making thereof paper fit for writing, printing, and other purposes." Koops received two more patents in less than a year, "for a method of manufacturing paper from straw, hay, thistles, waste, and refuse of hemp and flax, and different kinds of wood and bark, fit for printing and other useful purposes."

9 "If all manufacturing variables are correct for the production of permanent paper, then cotton fiber paper will be more durable and permanent than wood fiber paper because of the characteristics of cotton fiber." <http://cool.conservation-us.org/byauth/roggia/barrow/chap07.html>. However, cotton paper mills still exist in the U.S., making high-end fine papers. Most of their pulp comes from cotton linters, short clippings that are a residue left from secondary ginning by seed oil companies after they remove longer fibers from cotton bolls for fabric.

10 In 1844, both Canadian inventor Charles Fenerty and German inventor F.G. Keller had invented the machine and process for pulping wood for the use in papermaking. In 1854 chemical pulp was patented.

quantities. This allowed an unprecedented increase in the number of printed media available to the general public. It also opened the floodgates of a new type of waste.

The Worldwatch Institute reports that global paper use increased more than six-fold over the latter half of the 20th century, and has doubled since the mid-1970s. Today about 93 percent of paper comes from trees, and paper production is responsible for about a fifth of the total wood harvest worldwide.¹¹ In an amazing change of industry, cotton, flax, hemp, and other vegetable sources of paper fiber now get billed only as “alternative fibers,” accounting for about four percent of paper production. And even though paper came about as a communication tool, in our consumerist society about half the paper produced goes to packaging.

But why recycle? The most obvious reason is because it costs much less to make paper from recycled material than from virgin pulp. The pulp and paper industry is the world’s fifth largest industrial consumer of energy (and third in the U.S., after the refining and chemical industries). It uses more water to produce a ton of product than any other industry. In many industrial countries discarded paper accounts for roughly 40 percent of the municipal solid waste. By contrast, making paper from recycled content rather than virgin fiber results in 74 percent less air pollution and 35 percent less water pollution.¹²

The good news is that Europe and the United States have gotten much better at recycling paper. In 2007, the recycling rate in Europe reached 64.5 percent. In 2008, the U.S. recovered 57.4 percent of consumed paper for recycling. Total U.S. paper recovery reached 54.3 million tons in 2007, 87 percent up from 1990. The bad news for Russia is that in the same period of time it has experienced a backward trend. If in 1990 Russian businesses recycled 1.6 million tons of recovered paper, in 2000 the volume of recycled paper went down to 1 million tons. According to the statistics I could find, only 27 businesses that recycle paper for new paper and carton exist in all of Russia. Fourteen businesses use recovered paper to make roofing materials. Market analysts state that most of the existing capacity for paper recycling has been created prior to 1990 and currently is underutilized. Unfortunately for Russian waste processors, the rest of the recycling system, from relevant laws to infrastructure, has vanished along with the Soviet Union.

This makes Vtorma Baikal a rare kind of survivor. The paradox it has to face is that its business was much more profitable twenty years ago, under the Soviet planned

economy, than it is today, in the supposedly free marketplace of modern Russia. Vtorma used to make half of its profit on compressing recovered paper alone, and sent 30 railway cars a month to carton producers across the country, from St. Petersburg to Ussuriysk in the Russian Far East. Back then the state gave subsidies to those who used recovered waste in their products, mandated a percentage of recyclables that each manufacturer had to deliver to waste processors, and punished non-compliers. “There was a systematic approach.” Mikhail Prokopievich showed me a publication by the Council of Ministers of the USSR from 1986, regulating recycling of different types of waste. “This specified in minute detail what, where, and how. In the mid-’80s we were following world leaders in the recycling field. Vtorma [then called Vtor-resource] had paper drop-off points in every city in the Irkutsk region, Buryatia, and Chita. We had a whole line of recycled products, from linoleum to plastic wrap and construction materials.” Mikhail Prokopievich pointed to the brown plastic lining that covered the floor of his office. “That’s our linoleum. I never replaced it. But after I saw new French products, I sold our line.”

The brown plastic, along with the big ancient telephone, conspicuous lack of a computer, and a wall-sized inscription “To the Winner of the Socialist Competition!” made for a very Soviet atmosphere. After all, Mikhail Prokopievich started his career at one of the most important institutions of Soviet economy, the *Gossnab*, or the State Commission for Materials and Equipment Supply. *Gossnab* was part of a complicated system in which state bodies managed the Soviet economy by making all production and investment decisions. Together with *Gossnab*, *Gosplan* (the State Planning Commission) and *Gosbank* (the State Bank) allocated resources to state enterprises across



Carton piles up in Vtorma's yard until they find a cheap way to send it to another processing factory.

11 I don't think anyone would be surprised to learn that the United States produces and uses a third of the world's paper.

12 <http://www.worldwatch.org/node/1497>

the country. Starting in 1928, *Gosplan* created “five-year plans” that directed development of all sectors of the economy for that period. State planning ministries set production goals for all goods and services, completion schedules, wholesale prices and almost all retail prices, determined the necessary input of labor and raw materials for each enterprise, and specified all salaries. *Gossnab* put these plans into action by distributing resource “funds” to different regions and enterprises — raw materials, equipment, food, consumer goods, even rubles.

The Soviet system had plenty of minuses, but before we get into those, consider the following. Centralized planning can keep inflation and unemployment at extremely low levels, minimize social disparity, and allow the state to concentrate all resources on a specific industry or product, which could play an important role during war, for example. Its minuses include the inability to correctly predict and react quickly enough to emerging social needs, which could lead to shortages (*defitsit*) of popular goods and services, and a high probability of incorrect decisions regarding investment or production volumes. The system often did not provide incentives for producers to use resources in a more effective manner, to increase the range of available goods and services, or to innovate. However, that did not have to be the case. China serves as a completely different example of centralized planning, one in which the controlling Communist party successfully blended elements of state control and private enterprise.

Perhaps Russia missed its China moment. The “first shoots of private enterprise began to appear after Ryzhkov traveled to China and saw their reforms,” reminisced Mikhail Prokopievich. Nikolai Ryzhkov was president of the Council of Ministers of USSR in the 1980s. Under his leadership the Council issued a decree allowing “cooperatives,” a hybrid of state and private-owned enterprises. Essentially, they could make a profit by determining unsatisfied demand, buying resources from the state at state-established prices and selling their goods or services at “market” prices. When I pointed out that the Chinese reforms may have been successful because they acknowledged a movement that had already started on the ground, whereas in the Soviet Union the reforms tried to instill the notion from the top down, Mikhail Prokopievich disagreed. “We already had underground cooperatives. If you went to Armenia in 1985, you would have seen illegal enterprises on every corner. Police were paid off [to keep out of it]. They were making “Italian” shoes in Armenia



Mikhail Prokopievich in his office in front of a Soviet banner, “Winner of the All-Soviet Socialist Competition, from the State Commission of Ministers of the Russian Federation for Materials and Equipment Supply.”

back then!” As for why the experiment did not succeed, the reasons are several. “After there was an earthquake in Armenia, Ryzhkov went there to help. People really liked him, so Gorbachev got jealous, removed him and put a guy from the Ministry of Defense in his place. Then they stopped making any equipment.” According to Mikhail Prokopievich, lack of planned investment into existing enterprises is one of the main problems facing Russian industry. “The economy needs to be regulated. Instead, they allowed a handful of people to buy up businesses for peanuts. And now look at Baikalsk [the notorious pulp and paper mill on the south shore of Baikal] — the owner does not invest anything into it. They have not built a new enterprise in the region for fifteen years. Irkutsk used to be an industrial city, now only five percent of factories remain. The city is full of pharmacies and burial service agencies.”

Even though the fall of the Soviet Union meant that Vtorma Baikalsk’s employees could buy it out, making it a private business, its director had a long list of complaints about the current state of affairs. “Where does all the money that they collect for landfills, emissions, storage of recyclable materials, go? To Moscow, when it should stay in the local budget.¹³ There were almost 300 million people in the Soviet Union and 600 thousand bureaucrats. Now we have 2 million state employees for 120 million people. Out of those, 2 million are in jail, 2 million work for the

13 A couple of times during our conversation Chernorubashkin referred to Muscovites as “moskali.” This word originated from Polish *moskal*, meaning someone from Moscow. With time usage by people in territories annexed by the Russian Empire (Poland, Belorussia, Ukraine, Lithuania), often referring to Russian soldiers, took on a negative connotation. In Ukraine after 2004 it was widely used in anti-Russian t-shirt and other souvenir slogans. In Russian it sometimes gets used in jokes for ‘linguistic authenticity,’ for example, to show “how real Ukrainians regard Russians.” However, I encounter this word very often in Siberia, with regard to Moscow policies or Moscow businesses, and it not only evokes an unpleasant image, but also clearly conveys the speaker’s contempt for the subject.

Ministry of Defense, and another 2 million in police forces. The U.S. has 120 people per policeman, and Russia has 70. Why do roads cost six times more in Russia than in Sweden, for example? Because 60 percent of any construction cost goes to bribes.”¹⁴

He complained about the “mafia” in the city administration, lack of transparency in government tenders, bureaucratic licensing, and lack of finances in federal oversight agencies. “We had to sell our boat and one of our factory buildings. I tried to rent one of our floors to the city administration in 1998 — after all, we were doing them a service by collecting trash and keeping it out of a landfill. The mayor agreed to include it in the budget, but then one of his underlings shot us down. I found out later on that I should have given him a percentage.” Mikhail Prokopievich showed me a letter to the local Duma complaining about a local businessman who happened to be a Duma deputy. “Businesses technically must recycle a certain amount of their paper, but instead they send it to landfills or to illegal processors. We mainly need good quality paper, from printing businesses. This guy put his sweetheart in charge of recycling, and it’s more profitable for her to deal with illegal outfits instead of a transparent organization. There are two unlicensed paper-processing operations in Angarsk, two in Irkutsk, and one in Ussolie. I’m going to write to the Duma because I have data on how much paper we are missing, and how many people in Irkutsk buy our eco-cotton. We cannot satisfy existing demand, and we had to raise the price even though we were trying to keep it at the old level.”

“Eco-cotton” is one of the three main products that Vtorma produces now. Vtorma’s website describes it as a superior insulating material. The other two are toilet paper and egg cartons. But lack of suitable paper constantly threatens to shut down production. Vtorma has already turned hundreds of volumes of Marx and Lenin’s “collected works” into bathroom necessities. “Those were the first to go in the early 1990s. Then they started to bring in Maurice Druon. Now bookstores send us unsold books. The problem is, people stopped reading and subscribing to magazines. We even brought paper from the Russian Far East.” Transportation prices make that prohibitive now. In his drive to keep Vtorma alive, Mikhail Prokopievich resorted to some Soviet tactics. He partnered with local schools to motivate kids to collect paper. Sometimes he approached

the school’s director or the person responsible for extra-curricular activity. In other instances an enthusiastic parent contacted him. As I sat in his office, one teacher actually came in to report on her kids’ monthly ‘harvest.’

Mikhail Prokopievich flipped through one of the notebooks on his table: “School #9 has been gathering paper for five years now. We give them gifts, sweets for holidays. They deliver a car each month. Comes out to about six tons annually. School #25 — here one of the mothers organized a tour of the factory for the kids, we provided a bus. They’ve been collecting since. We’ll take two bags, even one. Old ladies sometimes bring two kilograms [of paper], they get about six rubles a kilo. Maybe they don’t have enough money to buy bread.” Altogether his schools deliver about 9 tons of paper a month, and he gets another 30 tons from regular citizens. That’s a sizeable part of Vtorma’s total monthly haul these days, which comes up to 205 tons of paper.

That may seem like a small number, but Chernorubashkin believes in recycling. One of the first things you see when you walk through the doors of Vtorma Baikal is the following poster: “Production of one ton of cellulose requires 5-6 cubic meters of wood, 350 cubic meters of water, and 2000 kilowatts an hour in energy use.”

As I listened to Mikhail Prokopievich talk, and watched his employees come to ask for a “small advance to pay for a garage” or for a funeral, I thought that Vtorma seemed more like an American mom-and-pop operation than a so-



Working under a poster of a pretty blonde advertising the 2008 Olympics, the women in the sorting hangar did not pay much attention to me and Galya as we went on our tour of the factory.

¹⁴ A recent newspaper article detailing the exorbitant costs of a planned “Third” road circumnavigating Moscow (the city is choking on traffic) estimated that it would be cheaper to build the road entirely out of new BMWs.



This woman's job involves climbing down into a vat where sheets of paper get churned into a pulp if something in the machinery gets stuck.

cialist leftover. At one point Chernorubashkin picked up the phone to discuss a monthly meat purchase with his Buryat supplier (our end of the conversation happened in Mongolian, which he learned while being stationed in the country for *Gossnab*). He takes a small sum out of his employees' salaries to buy "good meat from a remote, clean area of Buryatia" for their personal use and Vtorma's cafeteria. "Because they will go through their salary in two or three weeks, but this way they will definitely have meat on the table." Later on, when we went to the cafeteria for lunch, I tried their beet soup and the meat in it was really good. The employees came up and sat at our table, discussing daily production issues. I wondered what would happen to Vtorma if Mikhail Prokopievich were to leave.

He does not want to leave, but he is not going to be there forever. Apparently, he had a stroke last year when Vtorma had to renew its license. The head of the licensing department at the Irkutsk office of the federal Environmental & Technological Oversight Agency told me that even her personal involvement could not make the licensing process easier. Tatiana has known Mikhail Prokopievich — and his recycling business — for decades, and apparently she tried to save him time and money last year. (As I wrote in the previous newsletter, one of the main complaints recycling businesses have about the current system is the cost of numerous "expert assessments" and "approvals" required by the licensing process.) "But they still needed to pass the environmental *expertiza*. The "governmental machine" rolls on and on, they need documents, tests, more documents..." Tatiana was the one who told me about Mikhail Prokopievich's stroke.

Many of his employees have worked with him for more than 15 years, from accountants to paper sorters. Galya, one of such old-time employees, took me on an excursion around the plant. In the sorting hangar several women in fur boots went through sacks of old books, ripping off covers and tossing them to the side. The unheated hangar and its cement floor seemed really cold to me, but Galya said the workers were fine. "Some of them have

been offered better-paying jobs in other parts of the factory, but they don't want the responsibility. This is a quiet, monotonous job that doesn't require much skill or effort, and that's what they want."

A bigger building housed the pulping machine where shreds of paper transformed into long rolls of toilet paper. Two workers cut them up into regular-sized rolls; another one loaded them into plastic bags, to be taken to the storage facility. The packaging varied; from pictures of old Hollywood-style sirens to baby seals, but the inside remained the same. Galya forced me to take a couple of rolls "as a souvenir." As we walked through the storage area, she complained about buyers who failed to pay for their orders. She pointed at stacked columns of toilet paper rolls: "We don't have enough crates to store everything now, and if they will only pay by New Year's, that means I will have to come out during the holidays to load their shipments and make room for new production." Some of the buyers, usually small storeowners, order really small



(Above) Inside Vtorma's factory, above the sheet of recycled paper, is a poster saying, "One who's friends with vodka is not needed at work" (it rhymes in Russian). (Below) This is how a long roll of recycled paper transforms into a ubiquitous toilet roll.



shipments. "Some people come to our factory store, where we sell a roll at cost for 2 rubles, buy a stack and resell them at their kiosk for 6 rubles. But I guess we can't do anything about that..."

My Vtorma souvenirs reminded me of toilet paper from my childhood, the grayish, rough paper that despite its quality was a rarity in Soviet bathrooms. Medieval Chinese may have been using toilet paper in 6th century AD, and Americans since Joseph Gayetty introduced his "medicated paper for the water-closet" in 1857,¹⁵ but an average Soviet citizen used newspapers until 1969, when toilet paper became available in the Soviet Union for the first time. Even then masters of the planned economy miscalculated the demand and toilet paper became another *defitsit*, available only in Moscow and only rarely. When it "hit the shelves," people lined up in queues to buy as many rolls as they were allowed, put them on a string around their neck, and triumphantly travel back home. Occasionally the person sitting next to them on the bus would inquire, "Where are they giving it out?"

Times have changed, and now Vtorma's toilet paper looks like an ugly duckling next to extra-soft, quilted, gleaming white two-ply rolls on store shelves. From an environmental point of view, the ugly duckling wins. But its selling point to the Russian consumer is its low price, not its provenance. As Russia comes out of the economic slump, what kind of toilet paper will its people demand? American companies spend millions on advertising of luxuriously soft toilet paper. Perhaps not by chance, close to 98 percent of toilet paper in the U.S. comes from virgin wood, whereas in Europe and Latin America, almost 40 percent of toilet paper comes from recyclable sources. In 2008 the *New York Times* reported a 40 percent rise in sales of luxury brands of toilet paper. In 2009 Quilted Northern Ultra Plush, the first big brand to use three-ply, sold 24 million packages in the U.S., for more than \$144 million.

Some environmental groups have begun campaigning against what they see as excessive waste of virgin wood on a product that gets three seconds of attention.¹⁶ Results followed. After more than four years of environmental pressure, Kimberly-Clark, the makers of Kleenex and Cottonelle toilet paper, agreed



Vtorma's simple production line
(Photo courtesy of Vtorma Baikal.)

to make their paper greener, pledging to use recycled paper or wood from sustainable forests for 40 percent of the fiber in all its tissue products, by 2011. But Kimberly-Clark also identified luxury brands such as three-ply tissues or tissues infused with hand lotion as the fastest-growing market segment in a highly competitive industry. Will the companies give up potential profits that easily? Move into emerging markets with less eco-minded consumers, like Russia or China? Or will technology reconcile public pressure with individual tastes?

Marcal Manufacturing, a New Jersey paper maker, is trying to persuade customers to try 100 percent recycled paper. Marcal says its Small Steps roll is as soft as the other non-recycled brands. In bizarre toilet paper news, a Japanese company has just come out with a machine that in 30 minutes turns 40 sheets of office paper into toilet paper. It's not clear why the machine is named "White Goat," but its maker claims that the machine saves 60 cedar trees annually. Here is the only problem: it costs US\$100,000. So until cheap 100 percent recycled paper, pleasing to all, appears, the most environmental solution may be the one chosen by the Muslim world. Water and soap. □

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CONTACT:

Phone: (202) 364-4068
Fax: (202) 364-0498
E-mail: icwa@icwa.org
Website: www.icwa.org

STAFF:

Executive Director:
Steven Butler

Program Assistant/
Publications Manager:
Ellen Kozak

Administrative Assistant/
Bookkeeper: Meera Shah

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15 Until then resourceful American settlers relied on used corn cobs, the Sears catalogue and the Farmer's Almanac (the latter even had a hole in it so it could be hung near the toilet).

16 Together with facial tissue toilet paper accounts for five percent of the U.S. forest-products industry.