

either the Spanish—or indeed the West's—candidate, but as the official nominee of the whole Executive Board, including its African members, and should thus be seen as a consensus candidate.

Furthermore, Mayor owes his success in Sunday's vote to the four votes of the socialist bloc, lead by the Soviet Union, which had up to that point been supporting the Bulgarian historian Nikolai Todorov. If this bloc had abstained to avoid alienating the Third World countries, the result would have been far more ambiguous, since Mayor would only barely have received a majority; the socialists' support for Mayor as a "consensus" candidate is seen as a reflection of a new Soviet desire for both a restructuring of Unesco, and the return of the United States and Britain to the Unesco fold.

A major diplomatic task now facing the organization is the need to heal the bitter divisions left by the unprecedented five rounds of voting spread over 10 days. These divisions were deepened by M'Bow's charges in his letter of withdrawal on Saturday that he had been blackmailed by the threats of several Western countries (including Canada and West Germany) that they would withdraw or delay their contributions if he was reelected.

Whether Mayor, for all his well-placed contacts, has sufficient weight to reestablish the North-South ties within Unesco—or whether a more established political figure, such as Uruguayan foreign minister (and well-known economist) Enrico Iglesias, would be better placed—is already being debated behind closed doors prior to the 7 November vote of the general conference.

Keen to build the necessary bridges, Mayor said on Sunday that one of his top priorities will be "the problems of development, particularly in Africa." But some questions are being raised in Paris over whether he has the decisiveness to handle the pressures that he will face.

U.S. officials are also being discrete about the implications of Mayor's nomination. M'Bow's departure, they say, will not itself lead the U.S. to reconsider its decision to resign, since this was based on concerns about the organization's activities that went far beyond the much-criticized personal management style of M'Bow.

Mayor himself said at the California meeting last year that as an initial gesture towards reform, "the director-general should be given special powers for 2 years in order to bring into effect the necessary changes and to draw up and put forward a new program." If he is appointed to the post next month, his first moves toward implementing this strategy will be watched with considerable interest. ■ **DAVID DICKSON**

## Engineers Hear a Competitive Parable

At the annual gathering of the National Academy of Engineering in Washington, D.C., four executives from American manufacturing firms told the audience a parable of sorts, of how their once competitive companies had become lazy or greedy or stupid or all three and how at the brink of disaster their companies had been saved.

The moral to the story fits snugly into the 14 October meeting's theme, "Responding to the Competitive Challenge: The Technological Dimension." The lesson was that becoming competitive again in manufacturing is not a complicated or esoteric affair. Rather, the industrial captains said, it requires such old-fashioned things as attention to detail, pride in workmanship, giving customers what they want, and firing enough workers. This simple message did not just roll off the assembly line, of course, but the executives say it needs to be relearned, even by industrial giants.

Until they saw the errors of their ways, the executives said their once fat and successful businesses had become slipshod operations. "Our factories were in disarray," said Thomas Blunt of General Electric Appliances. "We had illusions of grandeur," said Barry Bebb of Xerox. "We were an F-minus manufacturer," said Richard Teerlink of Harley-Davidson Motorcycles. "We thought the U.S. could no longer compete in the small car business," said Mark Hogan of New United Motor Manufacturing, a joint venture between Toyota and General Motors.

There were plummeting profit margins and loss of market share, particularly to the Japanese, which substituted nicely for the big bad wolf in most of the stories. Xerox, for example, went from selling 95% of all copiers to selling about 20%. GM noticed that foreign manufacturers held 28% of the U.S. small car market. Harley-Davidson was on the brink of ruin, with even hard-core fans of the superheavyweight bikes opting for the sleeker, betterbuilt Hondas and Kawasakis.

How the companies returned to a state of competitiveness also contained similarities. Usually, workers went out the door. At Xerox's 20 manufacturing facilities worldwide, the company dropped from 19,300 employees in 1981 to 9,000 workers in 1987. Better engineering, Bebb said, cut the number of required workers. In a more radical move, GE Appliances decided to automate and thereby take most humans out of the loop completely. At the company's \$100-million facility in Columbia, Tennessee, where GE makes rotary compressors for

refrigerators, only six employees per shift actually touch parts on the shop floor. The other 70 seem to spend most of their time fiddling with the computers that run the operation. The factory, Blunt said, could operate in the dark, but it was "cheaper to leave the lights on than give the technicians flashlights."

Vendors also got the boot. Harley-Davidson cut suppliers by 50%. Xerox cut back from 3000 vendors in 1981 to less than 300 today. The companies also demanded higher quality. In the old days, Bebb said, Xerox used percentage figures to determine "line fall out," meaning that if 97% of a vendor's parts were good, only 3% were unusable in the assembly line. Then Xerox realized that a 3% line fallout equaled 30,000 bad parts per million. That's a lot of bad parts, said Bebb. Today the company insists on no more than 300 bad parts per million, a figure Bebb admitted was still higher than Xerox's Japanese competitors.

For those vendors and employees left after the purges, the companies decided they would treat them better. The vendors were treated more like business partners than interchangeable providers of parts. The workers, the executives learned, also had something to contribute to management. Xerox formed quality circles. After spending years hitting labor over the head, Teerlink said Harley-Davidson gathered all its people together and told the hourly employees: "You don't have to wear a white shirt and tie to be smart."

Probably the biggest change for employees occurred at New United Motor Manufacturing's car plant in Fremont, California. The factory makes both Toyotas and Chevy subcompacts. GM is responsible for sales, service, and parts. Toyota does manufacturing layout, product design, and engineering. (In themselves, these are telling job assignments.) Though Hogan stressed the plant is "a very standard operation," what is not standard are the concepts introduced by the Japanese. Among the new words to learn: *kaizen*, the search for continuous improvement, meaning workers are consulted, and *jidoka*, the quality principal, which gave every worker in the plant the ability to stop the assembly line. *Jidoka*, said Hogan, initially made GM management very nervous. They worried for nought. According to Hogan, the Fremont plant is the most productive automotive plant in North America. The grievance load is down from 5000 cases to 30. Some stories do have happy endings, or middles, at least. ■

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