

604

here the outlook is mixed.

On the one hand, the quality of much of the current writing about contemporary China since Tiananmen has been more balanced and insightful than often in the past. Exemplifying this trend is the excellent reportage of the husband-and-wife team of Nicholas Kristoff and Sheryl WuDunn in the *New York Times*. On the negative side, one can already detect a new and potentially misleading paradigm taking shape. With Marxism-Leninism completely discredited as both an ideology and a working system, the new conventional wisdom goes, communism in China will soon be swept aside as the octogenarians currently clinging to power die. Their deaths will inevitably lead in a few years to a new era of political reform and economic pragmatism.

In a sense, the new reasoning goes, the current oppressive regime isn't even very important because it's not going to be around long. Few hope otherwise, but as Mosher himself would point out, it would be foolhardy to make the sweeping assumption that communism in China cannot survive until the end of the century. Members of the Marxist-Leninist New Class in China are hunkering down now that events in the Soviet Bloc have demonstrated to them that a few reforms can lead to the crumbling of an entire communist edifice.

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The Austrian economist Israel Kirzner has argued recently that profit is a reward for what he calls "alertness." Sheer—or as we say "dumb"—luck is one extreme. Hard work is the other. Alertness falls in between, being neither luck nor routine work. Pure profit, says Kirzner, earned by pure entrepreneurs, is produced by alertness.

Mokyr's story can be told with Kirzner's metaphors, to the advantage of both. As both emphasize, the systematic search for inventions can be expected in the end to earn only as much as its cost. The routine inventor is an honest workman but is worthy therefore only of his hire. The cost of routine improvements in the steam engine eats up the profit. It had better, or else the improvement isn't routine. Routine invention, as Mokyr says, isn't a free lunch. "The cold and calculating minds of Research-and-Development engineers in white lab coats worn over three-piece suits" created some of the inventions. But only some.

The classical economist down to the present says there is no free lunch. At the margin (and margins in the classical world are everywhere) no one earns supernormal returns. Classical economics lies behind the Marxoid view of the Industrial Revolution. The revolution, they say, entailed the sacrifice of the poor. The poor paid the price of industrialization. The parallel view among the anti-Marxoids is that it was, on the contrary, the rich who paid the necessary price, through their saving. Anyway, the classical theory is that someone had to sacrifice. You don't get something for nothing. Make more guns and you must make less butter. Scarcity reigns.

But the Industrial Revolution doesn't appear to have been a matter of scarcity and tradeoffs. Something happened beyond the grim sacrifice of one generation for the comforts of the next. There was, says Mokyr, "an increase in output that is not commensurate with the increase in effort and cost necessary to bring it about." The fact has been known in economics since the 1950s, when Moses Abramowitz and Robert Solow

Beyond the Margin

BY DONALD McCLOSKEY

The Lever of Riches: Technological Creativity and Economic Progress
By Joel Mokyr, New York and Oxford: Oxford University Press, 349 pages, \$24.95

Give me lever and a place to stand on, said boasting Archimedes, and I shall move the world. What is odd about his world of the classical Mediterranean is that for all its genius it didn't apply the lever, or anything much else, to practical uses. Applied technology, argues Joel Mokyr, was a Northern European accomplishment. The "Dark Ages" contributed more to our physical well-being than did the glittering ages of Pericles or Augustus.

From classical times we got toy steam engines and erroneous principles of motion. From the 9th and 10th centuries alone we got the horse collar, the stirrup, and the mold-board plow. From an explosion of ingenuity down to 1500 we got in addition the blast furnace, cake of soap, cam, canal lock, galleon, cast-iron pot, chimney, coal-fueled fire, cog boat, compass, crank, cross-staff, eyeglass, flywheel, glass window, grindstone, hops in beer, marine chart, nailed horseshoe, overshoot water wheel, printing press,

ribbed ship, shingle, ski, spinning wheel, suction pump, spring watch, treadle loom, water-driven bellows, weight-driven clock, wee drop of whiskey, wheelbarrow, whippletree (see "The Wonderful One-Hoss Shay"), and the windmill. Down to 1750 the pace merely slackened, without stopping. And then came "The Years of Miracles," as Mokyr calls them, 1750 to 1900.

In the end, the thing to be explained is the Industrial Revolution, which during a century and a half raised the bread, ships, and innocent amusement available to the ordinary person by a factor of 12. The Industrial Revolution, in Mokyr's view, isn't properly thought of as a late and sudden shift to capitalism. It was the culmination of a millennium of technological creativity. In the 1930s a British schoolboy, when asked on an examination to explain the Industrial Revolution, penned an immortal line: "About 1760 a wave of gadgets swept over England." Mokyr amends the child's wisdom: From

first drew attention to the "residual." The residual is the enrichment left over after routine investment has explained as much as it can. It is embarrassingly large.

Mokyr's book summarizes in a lucid and accessible way much of the attempt over the past decades to explain it, from Schumpeter's theory of great inventions through the cost-benefit studies by Robert Fogel, Nathan Rosenberg, and others in the New Economic History, down to the new institutionalism of Douglass North on the right and Alfred Chandler on the left (this last located, oddly, in the Harvard Business School), Mokyr brings the news that all these attempts to explain the residual by hard work have failed.

If hard work wasn't the cause of the Industrial Revolution, is the explanation to be found at the other extreme of Kirzner's spectrum? Was it sheer dumb luck? Mokyr turns over the notion that the revolution happened by luck and rejects it. After all, it happened in more than one place (in Belgium and New England as well as in Britain, for instance) but spread selectively (to Northern but not Southern Italy; to Japan and Korea but not China.)

Well, then, is it Kirzner's metaphor of "alertness" that explains Mokyr's "lever of riches"? Yes. Mokyr makes a distinction between microinventions (such as the telephone and the light bulb), which responded to the routine forces of research and development, and macroinventions (such as the printing press and the gravity-driven clock), which did not. He stresses throughout that both play a part in the story. Yet he is more intrigued by the macroinventions, which seem less methodical and, one might say, less economic. Guttenberg just did it, says Mokyr, and created a galaxy.

So Mokyr's story can be aligned with economic metaphors. But there is something missing in the metaphors and in the story, something needed to complete the theory. From an economic point of view, alertness by itself is highly academic, in both the good and the bad sense. It is both intellectual and ineffectual, the occupation of the spectator, as Addison put it, who is "very well versed in the theory of a husband or a father, and can discern the

errors of the economy, business, and diversion of others better than those engaged in them."

If his observation is to be effectual, the spectator has to persuade a banker. Even if he is himself the banker he has to persuade himself, in the councils of his own mind. What is missing, then, from the theory of technological change is power. (Marxoids, rejoice.) Between the conception and the creation, between the invention and the innovation, falls the shadow.

At the root of technological progress is a rhetorical environment that makes it possible for inventors to be heard. Free speech leads to riches.

Power runs between the two. An idea without a bankroll is just an idea. In order for an invention to become an innovation the inventor must persuade someone with a bankroll.

This is as true of literary or scientific opportunity as it is of technological invention. Until he won the Goncourt Prize in 1919, the French didn't take Proust seriously. Until Saul Bellow put his imprimatur on William Kennedy's books, Kennedy (author of *Ironweed*) worked as a reporter on a bad newspaper. Intellectual bankers need to be persuaded as much as financial ones.

Mokyr understands this perfectly well, and calls it "openness to new information." He quotes a writer who contrasted the delightful stage of alertness with the less delightful stage of persuasion, which is "a struggle against stupidity and envy, apathy and evil, secret opposition and open conflict of interests, the horrible period of struggle with man, a martyrdom even if success ensues." Any academic or businessperson can supply instances. What matters, to put Mokyr's theme in rhetorical form, are the

conditions for persuasion. Europe's fragmented polity made for plural audiences, by contrast with intelligent but stagnant China. An inventor persecuted by the Inquisition in Naples could move to Holland. "It seems that as a general rule...the weaker the government, the better it is for innovation."

Early in the book Mokyr asserts that there is no connection between capitalism and technology: "Technological progress predated capitalism and credit by many centuries, and may well outlive capitalism by at least as long." One doubts it. Capitalism was not, contrary to the Marxoid story that dominates the modern mind, a modern invention. As David Herihy, an expert on the Middle Ages, put it 20 years ago, "research has all but wiped from the ledgers the supposed gulf, once thought fundamental, between a medieval manorial economy and the capitalism of the modern period." And any idea requires capitalism and credit in order to become an innovation. The Yorkshireman who invested in a windmill in 1185 was putting his money where his mouth was, or else putting someone else's money there. In either case he had to persuade.

What makes alertness work, and gets it power, is persuasion. At the root of technological progress is a rhetorical environment that makes it possible for inventors to be heard. So the Industrial Revolution was rhetorical. It was the climate of persuasion that made Europe great.

The conclusion is pleasing, if it is true. Free speech leads to riches. The plain speaking that has characterized Europe since the dark ages is what has made it rich. No wonder that the nations where speech was free to a fault were the first to grow rich: Holland, Scotland, England, Belgium, and the United States. And no wonder *glasnost* pulls in tandem with *perestroika*, with Gorbachevian persuasion first of all.

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