THE OLD, TIRED IDEA that America has only a finite number of jobs -- and that we must guard them zealously against raids from cheap foreign labor -- has been making a remarkable comeback. The only difference is that its upside-down view of the economy has plumbed new depths.

In addition to protecting factory jobs, now there’s a move to circle the wagons around a new target -- white-collar work performed by the folks with advanced degrees.

Rarely have so many been asked to protect the privileges of the few. True, the high-speed coaxial cables that girdle the globe courtesy of information technology have opened the gates to a new level of skill -- and new possibilities for offshore labor.

But those who imagine a scarce reserve of skilled jobs that can only get drained by developing nations should wonder why the U.S. didn’t run out of them a long time ago. Whatever has been “stolen” by cheap foreign labor is nothing compared with the long history of grand larceny from new technology, rising productivity and changing tastes. But since human desire has no limit, there’s always an infinite amount of work to be done. And in this market economy, an abundance of new opportunities.

Over the next 10 to 20 years, in fact, skilled jobs will be on the rise as never before. They will proliferate in nursing, computer science, entertainment, financial services and entire fields that may now be just a gleam in the eyes of the innovative. The upshot: Today’s toddlers and teens will be handed enormous opportunities for challenging and creative careers. There should be plenty of work for older folks, too.

At least five broad trends promise to transform the jobs market. Start with three that are nearly certain to occur between now and 2025. The baby boomers will become senior citizens. The labor force will grow at a much slower rate than before. The Medicare system will be hit by a financial crisis of major proportions.

Two others are worth betting on. The IT Revolution, Part 2, is about to begin, with new kinds of information technology developed to serve the needs of the increasingly prevalent “knowledge workplace” -- fields in which brain power, rather than machinery or processes, drive production.

This second revolution will be powerfully reinforced by our fifth and final trend: Spending on intangible capital, or IC -- assets like patents, copyrights, brand names, trademarks and trade secrets -- will continue to grow faster than outlays on tangibles like structures and equipment. That’s because of both a boom in products developed by science and a proliferation of niches in the global marketplace.

How will these trends influence the kind of work we do? The major effect will be to boost the share of the labor force with “knowledge worker” in their job description. The growth and development of both IT and IC should bring millions of new recruits to the knowledge workplace.
For example, the number of computer programmers, systems analysts and scientists almost doubled from 1992 through 2002, to 2.4 million. No surprise if another doubling occurs in the decade to come.

But greater investment in intangible capital also requires a diverse range of knowledge workers, including biologists, physicists, nehru-scientists, advertising writers, Web designers and high-end salespeople.

Knowledge workers will also find huge opportunities in serving the aging baby boomers, mainly in health care but also in financial services, particularly since older investors often demand personalized attention. Smart, personable bankers and brokers will be in greater demand than ever before.

Since boomers will have time on their hands, they’ll create expanding opportunities for travel agents and gambling croupiers, for actors and directors in film and video, and for experts in Internet-related work.

On the darker side of things, as the elderly population starts growing much faster than the working population, the “dependency ratio” between productive and unproductive people will decline. That falling ratio will spur the unraveling of Medicare, although the inefficiencies and misallocation endemic to the health-care sector will also play a major role.

The boomers, of course, will be hit even harder. One way they’ll cope is to keep working for a paycheck far longer than older people do currently. Ironically, the numerator in that falling ratio -- slower growth in the sales force -- will in this case operate in their favor by creating greater demand for their services.

So expect an increase in the average age of retirement, and a huge expansion in temporary and part-time work done by seniors. Firms may spring up that specialize in placing older people.

There may also be rising demand for another kind of knowledge work -- that of therapists, psychiatrists and substance-abuse counselors. The upheavals in health care should cause trauma enough. Plenty of folks may have a hard time adjusting to the strains and anxieties unique to the knowledge workplace.

Next month the Bureau of Labor Statistics will publish its biannual job projections, with 2012 as the target year. The report will include the usual nuggets of insight. It will also remind us of the old joke about economists showing their sense of humor by putting decimal places in their forecasts. Literally hundreds of job categories will be listed, each with its own estimate for 2012 running in the three figures. Moreover, says Peter Francese, founder of American Demographics magazine, the whole approach is static. The BLS would have us believe that no job on its list is in danger of going extinct, and that none it doesn’t already know about has a chance of being created.

For example, 10 years ago, no one expected to be able to apply for the job of Web designer. And since November 2002, Amazon.com has employed a “chief algorithm officer.”

The future could bring such new job titles as “artificial-brain designer,” suggests Leonard Nakamura, staff economist at the Philadelphia Federal Reserve. “Artificial brains,” such as hearing aids wired to the gray matter, have already cured deafness. Since blindness, dementia and poor sexual response have yet to be adequately taken care of, ABDs should be in great demand.
Good-Bye to the Butcher

Before venturing further into the realm of tomorrow’s jobs, it’s helpful to look at the trades likely to fall by the wayside. Among them: butchers, whose work is being usurped by food-processing plants; barbers, who live in the increasingly remote hope that men will desert their hairdressers for cheaper trims; and workers in the farm sector, where productivity just never stops rising.

As for factory jobs, management theorist and futurist Peter Drucker remarks in an interview that they are likely to follow the path of farm jobs. With 14.5 million positions as of November, manufacturing accounted for 11.3% of all U.S. jobs, down from a peak 32.1% in 1953.

Table: Where the Jobs Will Be

Over the next 10 to 20 years, skilled jobs will be firmly on the rise, offering opportunities to people of all ages. But some old standbys, like manufacturing and secretarial work, are in long-term decline.

**FAST GROWING:**
- Registered nurses
- Physicians’ assistants
- Mental health workers
- Health-services entrepreneurs
- Biologists
- Neurologists
- Web designers
- Marketing professionals
- Advertising writers
- Computer programmers, systems analysts
- Financial planners, personal bankers
- Assistant morticians
- Television personalities
- Actors and directors (movies, TV)
- Athletes, coaches, umpires, referees
- Gaming industry croupiers

**JOBS IN DECLINE:**
- Butchers
- Barbers
- Manufacturing workers
- Agricultural workers
- Secretaries
- Clerks

Source: Barron’s

Drucker predicts that 20 years from now, manufacturing employment will have fallen to its pre-World War I share of 7%, as robotics continues to make inroads into every conceivable task. For example, “systems integration” proposes to connect the factory floor with the scanners at Home Depot and Wal-Mart, eliminating middle-men between factory and store.

The main cause of past and future job declines is the unceasing growth of productivity driven by information technology.

Yes, cheap foreign labor has definitely contributed, but if manufacturing jobs were really “fleeing” at the rate folklore imagines, we would first have to see a dramatic decline in domestically produced output. After all, whatever foreign labor produces is reported as imports, not as anything produced locally. And if anything, we’re seeing just the opposite.

Real domestic output of manufactured goods (measured in terms of value added) has actually been growing faster than the rest of gross domestic product. From 1990 to 2000 -- the last two peak years of the business cycle -- manufacturing rose at an annual rate of 3.7%; real GDP excluding manufacturing, by 3.1%.

Over the same period, output per worker in manufacturing grew even faster than output itself, so employment fell.
The decline of secretarial and clerical work is essentially the same story. The main difference is that no one thinks offshore workers are responsible. Instead, blame e-mail, voice mail, personal computers, cellphones, PowerPoint, Palm Pilots, BlackBerrys and Excel spreadsheets.

The number of clerks in the U.S. rose at an annual rate of 2.4% from 1985 to ‘92. Then, from ‘92 to ‘02, growth slowed to 0.6%, one-fourth that rate. At the end of that period, 14.4 million people were in clerical positions.

For secretaries, it’s not a matter of slowed growth, but of absolute shrinkage. Their number peaked at 5.3 million in 1987, and then fell in every succeeding year, to 3.5 million by 2002.

The long-term decline should continue with clerks following not far behind. Here’s why:

First, it’s only a matter of time before the generational divide in the use of information technology melts away. Among managers and professionals, there’s still a rough inverse correlation between age and the degree to which IT is used to do things.

A Midwestern lawyer, age 56, has been ordered by his firm to stop dictating his briefs to a secretary and start composing them directly on a computer. He hasn’t complied. How, he asks, can he change his modus operandi after so many years? Eventually, his breed may be extinct.

The second key reason springs from a lead/lag theory: Private use of labor-saving technology leads to government use, in this case, with what seems to be a five-year lag. From 1992 to 2002, a disproportionate share of the increase in the clerical workforce occurred in the government sector; and over the same span, the decline in the number of secretaries occurred mostly in the private sector. The same data also reveal that government has been running about five years behind the private-sector trends in both categories. The onward march of new technology is the final reason to expect a long-term decline in clerks and secretaries. For example, companies are scrambling to develop better voice-recognition software, enabling your personal computer to take dictation with minimal glitches.

As in manufacturing, the high end of these professions will survive. Administrative assistants now do relatively little old-style secretarial work; they’ve mainly been transformed into knowledge workers. And now that computers can be programmed to decide how information should be sorted and used, the high-end clerical workers will have to know enough to countermand those decisions when necessary.

**The Case for Tech Jobs**

Speaking of computers, alarms have recently been sounded about the transference offshore of computer analyst, scientist and programming jobs. According to media reports, there’s been a flood of such moves lately and it may be the start of an alarming trend.

However, apart from anecdotes, the only evidence the alarmists cite is the jump in joblessness to 5.2% in 2002 for computer-systems analysts, scientists and programmers. But that 5.2% was lower than the overall rate of unemployment. And the total number of jobless technology workers that year -- 2.35 million -- was still below that in any other years, except for the wonder years of 2000 and 2001 at the tech boom’s apex.

Not that jobs aren’t moving abroad. But in this case also, the high-end will remain. No creative team can function properly when key participants are 8,000 miles apart. Also, new developments are coming so quickly in technology that offshore workers are usually a little behind the curve, says the Philadelphia Fed’s Leonard Nakamura.

Because so many people flocked to this industry in the boom years, the shakeout may still be going on. From 1.5 million in 1995, the tech labor force peaked at 2.6 million in 2001 and then began to decline. But another doubling in the next 10 years looks easy. A growing economy will create more job opportunities, but the real turbo-charging will come from
new products.

For example, Toshiba has developed a hard drive the size of a quarter, and IBM has built a computer that cuts computing time in half (yet again!) for large applications. Big Blue also is offering “on demand” service to firms that don’t want to pay for an expensive server.

Moreover, the looming second IT Revolution will require far more effort and innovation than the first. One reason is that so much has to be undone: Many systems now in place aren’t very effective at serving either workers or customers.

An expose that was well ahead of its time was published in 1997 by the Palo Alto Research Center of Xerox. Written by PARC researchers Jack Whalen and Erik Vinkhuyzen, it described in harrowing detail a system installed in call centers run by the fictitious “MMR Corp.”

In fact, as Simon Head reports in his recent book The Ruthless Economy (2003), MMR was Xerox itself.

At the time, Xerox was using a system called CasePoint for employees who took calls from customers having trouble with their equipment. The employee was a kind of cable connection between customer and computer. With no training in how Xerox equipment actually worked, all he would have to do is click on certain icons based on certain words the customer uttered. Scripts flashed on his screen that he had to recite, while the software was supposed to figure out everything.

But as Head reports, the results were ruinous. CasePoint went haywire whenever customers used unanticipated words to describe a problem, presented information in circuitous steps the program couldn’t follow or simply failed to mention relevant facts.

A Xerox spokesman told Barron’s that CasePoint has been replaced by a system that gives workers more room to intervene.

More such reforms seem inevitable, giving rise to work for skilled computer specialists. But unfortunately, as Head reports, in many of the over 60,000 call centers in the U.S., employing up to six million people, the employee-as-cable-connection approach is still being used.

Another kind of knowledge work is also on the ascendance -- diverse specialties that create, research, develop and maintain intangible capital (IC).

Examples of powerful intangible capital abound throughout American industry. The formula for Coca-Cola is a trade secret. Coke ads keep the brand from depreciating. Without their drug patents, shares of drug companies like Merck and Wyeth would be worth a fraction of their current price.

Indicating that investment in intangible capital is on the rise, nearly twice as many patent calculations were filed in 2000 than in 1989. In addition, spending on IC accounted for 40% of nonfinancial corporate overhead in 2000, up from 10% in 1978, according calculations by Nakamura.

The rise of IC also answers the Hollowing-Out Riddle.

The hollowing out of the corporation, which began in the ‘Eighties and continued through the ‘Nineties, was designed to eliminate layers of middle management. But then, why do managers and executives account for a record share of the workforce -- 15% in 2002, versus 12% in 1989?

A clue is that one of the fast-growing categories in Bureau of Labor Statistics data is “Managerial, n.e.c.” -- for “not elsewhere classified.” It stood at 8.5 million in 2002, having risen at an annual rate of 3.2% since 1992. Many of these jobs are those of intangible-capital workers. More than likely, the answer to the Hollowing-Out Riddle is that IC work is soaring.
Why? The explosion of new products is one reason. Another lies in the potential of the global marketplace itself. As Nakamura points out, niche markets can now be created that could not have existed before. IC workers now account for about one of eight members of the private-sector labor force, he adds. Among them: scientists, marketing consultants, ad writers and creative people not elsewhere classified. He plausibly predicts that the figure will rise to one in six in 10 years.

Meanwhile, the baby boomers aren’t getting any younger. This year, the youngest will be 40; the oldest, 58. So within 10 years, the number of folks 55 and older will begin a growth trajectory that outstrips that of the younger segment nearly fourfold. The number of U.S. residents 55 and older will rise from 63 million today to 83.7 million by 2014, and 101.4 million by 2024.

This army of gray will make staggering claims on the health-care sector. The Bureau of Labor Statistics counted 10.1 million health-care workers in 2002, including physicians (825,000), registered nurses (2.3 million), and a broad category of “nursing aides, orderlies, and attendants” (2.2 million), which includes nursing-home workers.

That 10.1 million represents an annual rate of increase of 3% since 1992. Fast by any standard, but not so fast compared with what’s to come, as the boomers become this sector’s prime customers.

Cost constraints that are already taking their toll mean that the fastest-growing segment of this workforce will consist of cheaper support staffers. The number of registered nurses actually grew more slowly than physicians from 1992 to 2002 (2.5% a year versus 3%). In fact, it’s been estimated that nearly a million new R.N.s must be recruited over the next five years alone.

That’s led to higher pay and hiring bonuses for nurses in many areas of the nation, making it more likely that Americans will be drawn to this demanding profession. In addition, the shortage has led the National Council of State Boards of Nursing to decide to offer licensing exams overseas this year. Now that foreign students view nursing school as their entrée into the U.S., the number of test-takers is likely to soar.

For another cost-saving measure that seems almost inevitable, the digitalized results of MRIs and related tests will be routinely interpreted by a specialist in Bangalore or Beijing.

**More Work for Seniors**

The financial noose will tighten still further as the “dependency ratio” falls. There are now 3.6 workers for every non-working person 55 and over. By 2014, government estimates say, the ratio will have fallen to 3.1 workers for every senior, and by 2024, to 2.4-to-1.

Not that you should believe those forecasts. There will have to be a lot more workers per senior to help prevent a fall in their standard of living -- and many of those workers will consist of seniors themselves.

The 2003 Retirement Confidence Survey of the Employee Benefits Research Institute found that 70% of all baby boomers expect to be earning a paycheck past retirement age. A good idea, under the circumstances. From 2004 through 2013, the Treasury will have to borrow an additional $3.9 trillion to pay for Medicare and Medicaid combined, according to calculations by economist Jagadeesh Gokhale of the American Enterprise Institute, based on estimates by the Office of Management and Budget.

To make matters worse, Social Security will start running a deficit around then. If nothing is done to cut costs or raise revenue, additional borrowings through 2023 will hit $7.4 trillion.

Pressure will build on the health-care system to do things more cheaply, or not at all. Outsourcing firms will seize the opportunity to market new ways of exploiting cheap labor, both locally and offshore. Will there be floating hospitals beyond the nation’s 12-mile limit?
Along the way, placing seniors in temporary and part-time work will become big business. Also, companies may institute “phased-retirement” plans in which employees gradually reduce their work time, says Dallas Salisbury, chairman of the Employee Benefits Research Institute.

Finally, about 15 years from now, the boomers will start exiting the stage in large numbers. Deaths per day, which now run 6,700 nationwide, will tack on another 1,000 by 2019 and take off from there.

Nearly 60,000 licensed funeral directors are currently doing business. Won’t we need many more?

Author Thomas Lynch, who owns a funeral home in Milford, Mich., believes it all depends on the kind of funeral boomers want. If the no-frills trend doesn’t abate, rising demand will probably be met by paraprofessionals. “The actual death rate is still about 100%,” he notes dryly. “But we can’t get folks enthused about dying more than once, and even then they’re not that enthused.”

On the other hand, he believes that job openings for funeral directors will remain plentiful. The turnover rate is incredibly high, and probably won’t change. Rookies soon find it’s hard to get rich in this line of work, but easy to become resentful over having to respond to calls at 2 a.m. to fetch a dearly departed.

But Lynch, who has published a series of engaging essays about his profession, adds that the work is deeply satisfying. When he does his job well, it matters. So the psychic income is enormous.

Of course, other kinds of knowledge work -- ranging from surgeon to teacher to computer programmer and financial planner, not to mention the many jobs yet to be created -- can also be rich in psychic income. Contrary to the alarmism borne of old superstitions, jobs like these should be even more abundant in America’s workplace of tomorrow.