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Labor

Summary Indicators on working women—Continued

(Data are seasonally adjusted unless otherwise indicated. numbers are in thousands.)

Indicator	1984			1985	
	I	II	III	I	II
6. Duration of unemployment¹					
Average (mean) number of weeks unemployed women have been looking for work	15.1	13.5	14.0	13.8	13.2
7. Marital status					
Married women, husband present:					
Civilian noninstitutional population	51,318	51,690	51,986	51,442	51,594
Civilian labor force participation rate	53.0	52.8	52.9	53.7	53.6
Unemployment rate	5.8	5.8	5.5	5.7	5.8
Women who maintain families:					
Civilian noninstitutional population	10,175	10,005	9,910	10,281	10,298
Civilian labor force participation rate	60.9	61.3	60.6	60.6	61.5
Unemployment rate	10.1	10.1	10.3	10.4	10.5

¹ Not seasonally adjusted.

NOTE: Due to rounding, and independent seasonal adjustment, some components may not add to totals.

Unemployment rates for midlife and older women are typically well below the rates for other women. Once unemployed, however, women 45 and older have a somewhat harder time finding a job. In the second quarter of 1985, they had been looking for work an average of 17.8 weeks compared with 13.8 weeks for those 20 to 44 years of age.

Employed women, in general, are predominantly in "white-collar jobs," but the oldest women are less likely to be in these occupations—

59 percent of those 65 and older, compared with about 65 percent below age 55. A smaller proportion of older women hold clerical/administrative support jobs, while a larger proportion are saleswomen, reflecting the greater availability of part-time hours in the retail trade. Another notable difference is the substantially higher proportion of older women than younger women in service jobs, a difference due largely to the greater concentration of the older women in private household and personal service work.

OLDER WORKERS**Older Workers and Their Work Patterns***

This section provides an overview of the status of older workers. The characteristics of the older worker population are described—how many there are, their unemployment levels, patterns of employment, and prospects for future employment. The section also discusses the decision to retire or keep working—incentives, disincentives, and optional work roles, such as volunteerism. The discussion then turns to special older worker populations—displaced workers, women, minori-

ties, and the handicapped—and their problems. This section concludes with a statement of the four issues that have emerged as a focus for developing actions by employers, government, and the community to address older worker needs.

Older Workers: Who They Are

Older workers encompass a wide age group—40 years and older according to the Age Discrimination in Employment Act, 45 years and older according to the Department of Labor definitions, and 55 years and older (the age group most likely to leave the labor force). Older workers

* Source: Bureau of Labor Statistics

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are not homogeneous; they include several special populations facing different problems. There are displaced older workers, who have lost their jobs and have no prospects of returning to them; disadvantaged workers (such as minorities, women, and those with health impairments); older workers facing retirement pressures due to skills obsolescence, pension incentives, and work force reduction plans; and retirees seeking to reenter the work force. The status of older workers in general, and the employment problems faced by special groups, can be important to employers, policymakers, and community groups seeking to address older worker needs, since these needs will be different for each population.

Age (years)	Millions of Workers 1980	
	Men	Women
45-54	9.91	7.07
55-64	7.16	4.59
65 plus	1.88	1.14

Age (years)	Labor Force Participation, 1980	
	Men	Women
45-54	91.2%	60.9%
55-64	72.3	41.5
65 plus	19.1	8.1

Source: Bureau of Labor Statistics

In 1980, over 18.9 million men and 12.8 million women were older workers according to the U.S. Department of Labor definition, which includes all those over 45 years of age who are employed, self-employed, or looking for work. In general, older workers are considered in three groups: those aged 45-54, who are still high on their earnings curve; those aged 55-64, who are beginning to drop out of the labor force (most for early retirement—planned or as a result of layoff—but some because of ill health); and those aged 65 and over (a much smaller number).

The 32 million older workers in 1980 are expected to rise to 38 million in 1995, with the greatest growth being in the age range 45-54. The Department of Labor expects the number aged 45-54 years to grow from 17 million in 1979 to 24 million in 1995 as the "war baby" generation ages. At the same time, the percentage of older men who remain in the labor force is expected to continue its 30-year decline and the percentage of older women who remain is expected to continue its increase. (More than half of all women are now in the labor force, and

the percentage will continue to increase, but the major part of the increase is in younger age groups, according to Sandell, 1983a.)

Unemployment

Until 1981, unemployment rates for older workers had remained fairly low; in 1980, the rate was 4%, in contrast to 7% overall. In addition, although special populations within the older worker group suffered from underemployment (worked part time or worked for only part of the year), almost all men aged 45-64 who were employed in 1981 worked full time, as did almost three-quarters of employed women in that age group.

This overall pattern of full-time work and lower unemployment, however, does not mean an absence of problems. The unemployment rate does not include those who drop out of the labor force, and the dropout rate is high for older workers, for whom layoff tends to become unplanned retirement (Rupp, Bryant, and Mantovani, 1983). For those older workers who stay in the labor force, a spell of unemployment typically lasts longer than it does for younger workers. For example, half of the men aged 55-64 who were unemployed in late 1982 were out of work for more than 13 weeks (Department of Labor, 1983).

Some unemployed older workers have exhausted both unemployment benefits and personal savings but are not eligible for any federally funded benefit except Food Stamps. These workers are of great concern, not only because of their need for financial support, but also because of their higher rate of emotional and medical prob-

Age (years)	Percent Unemployed 1982	
	Men	Women
55-64	6.5	5.1
65 plus	5.3	3.9

Source: Bureau of Labor Statistics

Age (years)	Percent of All Those Working, 1981	
	Men	Women
Working full time		
Age 45-64 years	94.5	74.6
Age 65 years plus	52.3	40.4
Working part time		
Age 45-64 years	5.5	25.4
Age 65 years plus	47.7	59.6

Source: Bureau of Labor Statistics

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lems. Disadvantaged workers, particularly those with little education, may be unable to find work unless they can get training in marketable skills. Displaced workers may be limited in their ability to move to areas that have employment opportunities for their existing skills because they have exhausted all assets except their home, for which no buyer can be found.

Employment

When laid-off older workers get new jobs, they tend to get a lower wage than they received in the previous job (Shapiro and Sandell, 1983). This is ascribed less to age discrimination than to the fact that they tend to have company-specific experience, not all of which is relevant to the new firm, rather than recent training in the latest techniques. In addition, older workers who keep their jobs face the problem that employers see their skills as obsolete because so much time has passed since they were trained (Andrisani and Daymont, 1983). Employers also tend to offer older workers fewer opportunities for training, at least in part because most older workers get higher wages than younger ones, and the time taken for training thus costs the employers more (Andrisani and Daymont, 1983).

When retired workers seek to reenter the work force, whether because inflation has eroded their income or for other reasons, they often do not find full-time work at desirable wages. Because of pension restrictions, the Tax Equity and Fiscal Responsibility Act (TEFRA), Employees Retirement Income Security Act (ERISA) provisions, and Social Security earnings limitations, most post-retirement workers are limited to part-time work, usually less than 1,000 hours per year. Although there are no exact figures on how many post-retirement workers are self-employed, observers generally perceive that the number is rising.

Improving Prospects for Employment

There is no systematic range of opportunities that would allow those older workers who are out of work, working for wages too low to live on, or working only part time, to improve their lot. The Comprehensive Employment Training Act (CETA) and the Senior Community Service Employment Program (SCSEP) were underused by older adults, although participation in either one had the effect of increasing the number of weeks worked (Rupp, Bryant, and Mantovani,

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Age (years)	Average Duration of Unemployment, 1980 (weeks)	
	Men	Women
55-64	21.6	19.9
65 plus	16.9	13.1

Source: Bureau of Labor Statistics

Age (years)	Percent of Unemployed Receiving Training	
	Men	Women
Displaced workers		
Age 25-44	3.8%	7.2%
Age 45 plus	3.5	1.7
Other		
Age 25-44	4.4	5.5
Age 45 plus	2.3	1.8

Source: Bureau of Labor Statistics

1983b). Training slots in CETA programs were often seen—by program operators and the community—as being aimed primarily at the young (Reesman, Rupp, and Mantovani, 1983). According to Rupp et al. (1983), fewer than 1% of those over 45 who met CETA eligibility requirements received CETA training. An even smaller percentage of those eligible for the SCSEP participated.

Finally, the Age Discrimination in Employment Act, although it has changed corporate practices in dealing with men and women aged 40-70, has not eliminated age discrimination. The number of grievances filed with the Equal Employment Opportunity Commission (EEOC) charging age discrimination has risen 75% over the last 3 years, to 10,000. (The number of grievances filed is not a clear reflection of the incidence of age discrimination, but it is some indication that age discrimination continues to be perceived.)

The Decision to Retire or Keep Working

The decisions of individuals to keep working past 65, to retire at 65, or to retire early have a very large aggregate effect on the Social Security system and on public and private pension funds. For that reason, considerable attention has been paid to the factors that influence these decisions. Factors that appear to have such influence include size of current wage, the ownership of assets or a vested pension of significant size, ex-

pectations about inflation, availability of suitable work arrangements, and availability of desirable alternatives, such as volunteer work.

The Department of Labor expects older men to continue their pattern of early retirement and declining participation in the work force, and expects a decline for women over 65 as well, but at a slower rate. At the same time, the declining rate of participation by men over 65 is somewhat deceptive, since the number of men alive beyond 65 increased from 7.6 million in 1960 to 10.1 million in 1981, so that a decline in the participation rate is not necessarily a decline in actual numbers. Furthermore, the decline is not constant across all occupations or all wage levels. Low-wage laborers show a greater decline in labor force participation with age that is partly accounted for by the increase in the number receiving disability benefits (Sandell, 1983b). Working beyond 65 is most frequent in wholesale and retail trade and in services and least frequent in mining and transportation, according to Morrison (1983).

Other factors may influence the labor participation decision. For example, older workers who are laid off, particularly because of the decline of an industry or a plant closing, tend to retire

early, not because they planned to but because retirement is preferable to the kinds of jobs available to them (Johnson et al., 1983). Also, Sandell points out that, for many older married women, continuing in the labor force will not give them a Social Security retirement benefit above what they would receive as the spouse of a worker covered by Social Security (Sandell, 1983a). Therefore, older wives may have little incentive to continue working if their husbands retire.

Polls indicate that many workers would like to stay on at their same job and wage if they could work fewer hours—an option not generally available. Jondrow, Brechling, and Marcus (1983) concluded that employers find part-time workers to be more costly per hour and less productive than full-time workers. The most common kind of part-time work is self-employment; part-time work for others is most common in agriculture, finance, insurance, real estate, and in personal service.

In a study of volunteerism among older adults, Jusenius (1983) found that the rate of volunteering among older adults was about one in five and that it did not differ by income level, race, or ethnicity, but that it did increase among men with level of education and level of income-producing assets, and among women with level of education and previous level of volunteer work. It appears that early retirement does not benefit society by resulting in increased volunteer work.

In addition to personal incentives and disincentives that affect the decision to retire or to continue working (dislike of the job, for example), there are a variety of laws and regulations that affect individual situations. For lower income workers, the ability to receive at least some income at age 62 is an incentive to retire. For higher income workers, there may be mandatory retirement at 65 or a pension system that encourages early retirement.

Percent of Sample Working
Stated Hours per
Week, 1978

Hours per Week	Percent of Sample Working	
	Men	Women
0-15	0.8%	4.1%
15-25	1.6	6.9
25-35	3.4	9.4
35-41	51.1	63.5
41-46	13.6	5.8
46-56	19.0	6.7
56 plus	10.5	3.7

Source: Jondrow, Brechling, & Marcus (1983)

Eligibility for and Participation in CETA II-B

Age Range	Percent of U.S. Population	
	Eligible	Participating
14-21	17.6	1.20
22-44	14.1	0.58
45-54	9.7	0.17
55-61	10.8	0.10
62-64	8.9	0.05
65-70	9.6	0.03
71 plus	12.0	0.01

Source: Rupp et al. (1983).

Median Time to Next
Job (weeks)

Age (years)	Median Time to Next Job (weeks)	
	Men	Women
Displaced worker		
Age 25-44	13	16
Age 45 plus	20	21
Other		
Age 25-44	9	11
Age 45 plus	13	19

Source: Johnson, Dickinson, & West (1983)

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Incentives for continued work include the absence of any other source of income or possible source of support. For example, Rupp, Bryant, and Mantovani (1983b) found that unemployed eligible adults over 45 tended not to participate in CETA (or SCSEP) if they lived in larger families, but did if they were single or widowed, living alone or in a small family.

Disincentives to continued work include the Social Security earnings test, the ability of companies to deny accrual of pension after age 65, and the legislation that requires employers to provide private health-care coverage for workers aged 65-69 if they provide health-care coverage for any workers. The extra cost of health insurance is not expected to lower the number of jobs available to older workers by more than 1% (Anderson, Kennell, and Sheils, 1983), because employers will compensate for the added cost (13% of compensation) by wage or benefit reductions. However, the reduction in wages or benefits reduces the reward for continuing to work. (Those persons who are still working at and beyond 65 are not, in general, those who are in ill health and heavy consumers of Medicare, so that the employer's health-care plan may not be as important to them as it would be to young workers with minor children, who often reject a job without health care benefits.)

In a study of the way employers view older workers, Paul (1983) found that employers perceived the Social Security earnings test to be a significant disadvantage in employing post-retirement workers on a temporary or part-time basis since workers would stop working when they had reached the annual limit. In addition, workers under age 65 who work part time are often precluded by their employers from working more than 1,000 hours in a year so that they need not be included in pension coverage under the ERISA.

All these factors that seem to push and pull older workers into early retirement, however, may be less important than expectations of longevity and expectations of inflation. On the average, the 65-year-old white male in 1979 could expect to live to be 79 and the 65-year-old white female could expect to live to be 83; blacks could expect to live to be 77 and 82, respectively. Because of these increases in longevity and because of expectations of the future rate of inflation, there was a tendency in 1980 for fewer workers to indicate that they planned to retire early (Meier, 1980). In particular, those with fixed pensions see inflation as a severe threat.

Survey of Older Adult Attitudes

	<u>Agree</u>
Nobody should be forced to retire if he/she wants to work and can still do a good job	90%
Most employers discriminate against older people and make it hard for them to find work	78%
Would prefer to retire at or after age 65 (asked of those 55-64)	67%
Would prefer working part time instead of retiring completely	
Younger adults	75%
Adults 55-64	79
Adults 65+ still at work	73

Source: Louis Harris and Associates (1981)

If labor force participation rates increase among older workers, the overall immediate effect on the labor force would not be great. Simulations by Storey (1982) suggest that if the mandatory retirement age had been raised from 65 to 70 in 1973, the size of the labor force would have increased very little. According to Fields and Mitchell, staying in the labor force would be encouraged most by policies that lowered Social Security benefits for early retirement and increased the gain from deferred retirement (Fields and Mitchell, 1983), but these measures would induce the average worker to delay retirement by no more than 3 months. In addition, such measures would penalize those older workers with a lower life expectancy and a concomitant need to retire early. It appears that measures that change the corporate culture (Paul, 1983) might be more effective in raising the number of individual decisions to keep working.

Displaced Workers

Recent research suggests that displaced workers do face more severe problems as they become older (Shapiro and Sandell, 1983). Displaced workers of all ages are more likely to engage in job search than workers laid off for cause or those who quit a job. Managers and clerical personnel generally can shift to different industries, or even different occupations; craftsmen are more likely to find new jobs in the same industry; and even with laborers, there is some indication that those who are 45-54 years old are as likely to find new jobs as those at the youngest end of the labor force. There is some wage reduction in the new job, but it appears to be related more to the discount applied to their company-specific

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experience rather than being a matter of age discrimination. Men over 65, however, do experience a decline in wages in the new job that is not accounted for by the discounting of their company-specific experience (Shapiro and Sandell, 1983).

Women

The evidence is less clear for women (Kohen, 1983; Clark, 1983). Women's earnings on the average never rise as high as men's earnings; the earnings curve is flatter throughout their working life. However, it peaks later than the curve for men (age 55 rather than age 50) and declines more slowly. There is disagreement over whether this pattern results from a combination of age discrimination and discrimination against women, or whether it results from the cumulative effect that women's historical lack of access to training opportunities on the job has over a working life. However, working women may also have different work patterns; in a population of Michigan workers, 43% of the men but only 16% of the women worked more than 40 hours a week (Jondrow, Brechling, and Marcus, 1983).

Minorities

Earnings curves for minority men appear to have the same shape as those for white men, but appear to be lower at all points along the curve. This trend is ascribed to the initial effects of racism on education and on early experience on the job. There is some evidence that the disparity between the earnings of minority men and those of white men decreases slightly for older workers. What appears to happen is that valued minority men are kept on and treated in ways that are statistically similar to the ways white men are treated, while the less valued minority workers either drop out altogether or find themselves in a succession of low-wage jobs. The effect, then, is not one of a combination of age discrimination and racism, but of racism primarily.

Handicapped

The evidence for the handicapped is scant, but it does tend to confirm an increasing penalty (lower wages, decreased employability) with age (Kohen, 1983). The reason for this effect is not clear. However, Clark (1983) finds that the earnings of those with health limitations peak sooner and decline more with age than the average. In

addition, although being physically handicapped is positively associated with CETA eligibility, it is negatively associated with CETA participation among those over 45 (Rupp, Bryant, and Mantovani, 1983b).

The Future

The labor force is witnessing a slow change in the number of older participants. Few workers over the age of 65 are deciding to remain in the work force at present, because of incentives to retire, as well as industrial change that makes continued employment or adaptation difficult. However, both the increase in the number of aged and shifting business and government concerns about pension costs and labor supply suggest that changes may occur in employer views toward encouraging retirement and in older workers' desire to remain on the job. Nevertheless, as this discussion shows, there are many worker groups whose special employment problems need to be systematically examined in developing new older worker employment policies and practices.

Four basic issue areas emerge as a focus for developing actions to address older worker needs, whether the population of concern is displaced, disadvantaged, in the work force, or trying to reenter after retirement, as Section III will show. The following table summarizes issues in these four areas. New views of benefits and compensation policies and practices, work arrangements, education and retraining opportunities, and marketing and placement assistance can help expand older worker employment options.

How Many Will Want Jobs?

The number of adults over 55 who were employed rose from 14.1 million in 1970 to 14.5 million in 1980. Another half-million adults over 55 were unemployed in 1980, not counting those classified as "discouraged workers."

Age (years)	Percentage Out of the Labor Force in 6 Months After Applying for Employment Services	
	Men	Women
Displaced workers		
Age 25-44	3.8	10.4
Age 45 plus	17.4	16.4
Other		
Age 25-44	7.7	13.2
Age 45 plus	15.3	19.0

Source: Johnson, Dickinson, & West (1983)

Summary of Older Worker Populations and Employment Issues

	<i>Benefits and Compensation</i>	<i>Work Arrangements</i>	<i>Education/Retraining</i>	<i>Marketing and Placement</i>
Workers at or near retirement	Companies rarely offer incentives to stay on.	Part-time work is most common option, but rarely at same job and wage.	Rarely offered by employers; adult ed. only public sector program for those employed.	Marketing to change employer attitudes could help.
Displaced workers	Loss of seniority affects wages in new job.	No special work arrangements needed or available.	Needed, but should build on existing expertise.	Active job seekers—need real support.
Disadvantaged workers	May not be adequate to allow for retirement planning; no incentive to keep working if any alternative available.	Underemployment (part-time work) is common.	Needed, but not often taken advantage of; rarely offered by employers.	Needed
Retirees seeking to reenter labor force	Pension, TEFRA, and Social Security earnings limits are disincentives.	Part-time work most common option; self-employment increasing.	Few programs available.	Utility demonstrated, but demands knowledge of employee needs and business conditions.

Between 1980 and June of 1982, the purchasing power of the consumer's dollar dropped by 14%. As the country recovers from its most recent recession, many older adults may find that pension amounts earned before the years of high inflation are no longer enough to support early retirement, and may stay on the job. Discouraged older workers and retirees may also decide to reenter the labor force in considerable numbers.

But that will be only a small change compared with the change that will occur as the "baby boom" generation ages.

Labor Statistics

The following tables have been carefully selected from *The Handbook of Labor Statistics* specifically for human resource managers. Each table begins with the earliest reliable data and ends with 1983. The information and tables included in this section are:

Tables:

Labor Force and Employment Status:

- 2. Employment status of the civilian noninstitutional population by sex, 1970-83.....
- 4. Civilian labor force by sex, race, and age, 1970-83.....
- 5. Civilian labor force participation rates by sex, race, and age, 1970-83.....

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- 15. Employed civilians by sex, race, and age, 1970-83.....

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- 19. Employed civilians by industry and occupation, 1982-83.....
- 23. Employed civilians with a job but not at work by reason for not working, 1970-83.....

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- 25. Major unemployment indicators, 1970-83.....
- 26. Unemployed persons by sex, race, and age, 1970-83.....
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- 35. Unemployed jobseekers by sex, age, race, and jobsearch methods used, 1976-83.....

Family Relationship and Weekly Earnings Data:

- 36. Unemployment in families by type of family, race, Hispanic origin, and presence of employed family members, 1982-83.....
- 39. Median weekly earnings of families by type of family, number of earners, race, and Hispanic origin, 1979-83.....
- 41. Median weekly earnings of full-time wage and salary workers by selected characteristics, 1979-83.....

Tomorrow in Brief**Video Phones: Popular Gift in 1990?**

A new video telephone, transmitting full-color images over conventional phone lines, may substantially reduce businesses' teleconferencing costs. A simplified version for use at home will probably soon follow, says the manufacturer, UVC Corp of Irvine, California. Meanwhile, The Futures Group of Glastonbury, Connecticut, forecasts that prices of slow-scan picture phones will drop to under \$200, making them a popular gift item in 1990. Printed books will be sent via phone, using high-speed laser printers (250 pages in 6-8 minutes) and easy-to-use binding systems.

UNIVERSAL STUDIOS TOUR



Trekkies "beam" aboard movie set in participatory tour.

Dream Vacations For Movie Buffs

Movie fans now have a new treat for their vacations. Instead of just touring studios, they can now act in a movie simulation and take home videotapes of their performance. Universal Studios has introduced "The Star Trek Adventure," in which Trekkies can dress as their favorite *Enterprise* crewmember and perform in a seven-minute scene from a *Star Trek* script. With special effects, the fan appears to work alongside actors William Shatner and Leonard Nimoy as Kirk and Spock. A similar tour of the Disney-MGM Studios at Walt Disney World will allow vacationers to "experience" such movie special effects as earthquakes, explosions, collapsing bridges, and floods.

For more information, see "Sources, Tomorrow in Brief" on page 55 of this issue.

Global Food Stamps

An international food-stamp program could be a less-costly alternative to traditional food relief and farm programs, according to University of Minnesota economist Willis L. Peterson. Under his plan, the poor in developing countries would receive free food stamps, funded by the world's richest nations. The stamps would be used to purchase food from local vendors, who could then exchange the stamps for hard currency to buy food stocks from either local markets or the world market. This scheme could improve world food prices and would likely cost less than current farm-income support and food-aid programs, Peterson claims.

Over-50 Workers In Demand

Jobless managers aged 50 or older may soon be finding jobs more quickly than their younger counterparts, according to surveys by Challenger, Gray & Christmas, Inc., a firm that counsels displaced executive-level workers. The difference between the median job-search time of managers over 50 and those under 50 has narrowed to about 15 days. Before 1985, younger execs usually found another job one to two months sooner, says the firm's president, James E. Challenger. As businesses place increasing value on experience when hiring managers, the over-50 group will be in greater demand than in the past, according to Challenger. Older workers also are less likely to switch jobs again and thus offer greater stability than younger workers. And experience means that the older worker will "work smarter" and not waste employers' time and money with the trial-and-error learning process, suggests Challenger.

Sneaker Power

The latest advance in shoe engineering is "energy return"—that is, the ability of an athletic shoe to return the wearer's expended energy. Energy return is measured by how much pressure a material pushes back, rather than absorbing, when it is pressed. For instance, Converse, Inc., claims its new "Energy Wave" shoe returns 50% of an athlete's expended energy. Such "spring" in the step could

New materials in shoe return up to 50% of athlete's expended energy.

mean a 3- to 5-minute reduction in a marathon runner's time or a 1-inch increase in a basketball player's vertical leap. Athletes may also experience fewer injuries and less fatigue, allowing them to work out longer and more safely.

Soybean Fuel for Buses

Soybean oil-based alcohol fuel is a possible substitute for diesel fuels both in the city and in the country. City buses that run on diesel are a major contributor to air pollution; get rid of diesel, and you get rid of smoke, says Carroll E. Goering, a University of Illinois agricultural engineer. Goering estimates that the use of alternative fuels could cut diesel-fuel use in half on farms, reducing reliance on imported oil as well as cutting pollution. Soybean oil reacts with ethanol to form ester, which burns like diesel, only more cleanly. However, there are currently no ester plants in operation in the United States.

Natural Sources For Safe Chemicals

Researchers believe safe agricultural chemicals will be derived from plants and animals. Chemicals made from fungi, for instance, have the "potential to repel disease-causing organisms, regulate plant growth, and serve as human drugs similar to penicillin," says plant physiologist Hank Cutler of the U.S. Department of Agriculture. A new generation of natural agricultural chemicals holds great promise, says Cutler, because "they work against specific targets, are extremely potent, and, because they're biodegradable, don't pose environmental hazards."

New Attack on Common Cold

The common-cold virus is fighting back in the war against the sniffles. A Purdue University team researching the structure of one cold virus—rhinovirus 14—has found that the virus changes its structure in order to prevent antiviral drugs from interacting with it. The antiviral agents work to prevent the virus from reproducing, but the virus

adapts, blocking the ability of drugs to bind. "It's as if the cold virus sticks out its arm—like a running back fending off a tackler," says one researcher. The team hopes that further research into the atomic structure of viruses can bring modern medicine closer to curing the common cold.

Purdue University researcher Michael Rossman works on a model of a cold virus.

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