ECONOMICS

Increase in Output Would Lower Unit Cost of Steel

Economists of U. S. Department of Agriculture Declare More Knowledge of Cost Functions Essential

WHETHER the steel industry, which reaches flexible fingers into many other industries, can step up its output in time with defense tempo and at the same time reduce its cost of manufacture, is a vital problem.

Some economists hold that the cost of making a ton of steel is practically the same whether the plant is running at 80% capacity or at only 50%, the American Statistical Association has learned from reports presented at their annual meeting in Chicago.

Analysis of records kept by the United States Steel Corporation indicated to Dr. Mordecai Ezekiel and Miss Kathryn Wylie, economists of the U. S. Department of Agriculture, however, that stepping up production from 50% to 80% of capacity actually decreases the unit cost of production about 17% to 10%.

Labor costs per ton of steel decrease materially as the output is increased, Miss Wylie told the statisticians. When a plant is operating at only 20% of its capacity, it takes 56 man-hours of labor to make a ton of steel. If the output could be stepped up to full capacity, the labor per ton would amount to only 32 man-hours.

Output per additional man-hour, she said, is about three times as great at 90% capacity as it is when the plant slows down to only 40% capacity.

"If this relation is found to hold true," she said, "in other mass-production industries such as automobiles, cement, aluminum, etc., material revisions may be required in much of current economic theory to make its assumptions consistent with the facts of a major part of modern industry."

"Our defense planning," Dr. Ezekiel and Miss Wylie conclude, "requires such information about our major industries that it may be most effective. Since steel is one of the major raw materials of defense, knowledge of the cost functions in that industry is particularly important.

"The prices which the government will pay for steel might be directly related to costs at different levels of output. Excessive profits might easily result from inadequate knowledge of these relations. On the other hand, the industry might be adversely affected by the adoption of an unduly low price structure without adequate knowledge of these relations."

The steel industry is in a peculiar position in regard to the balance of increased purchasing and lowered prices, Dr. W. Gregg Lewis, of the University of Chicago, told the meeting.

The railroads as large purchasers of steel were cited by Dr. Lewis as an example of this dislocation. Since the railroads do not sell steel products but services, he explained, the amount of their purchases depends upon the amount of travel or shipping and not upon the price of steel.

The question was raised by Dr. Lewis, however, as to whether the timing of railroad purchases might not be adjusted to periods of low steel prices, regardless of the fact that amount of purchase is independent of the price to be paid.

"There is practically no evidence in the historical record that the railroads have followed such a policy," he declared. "The decisions required are apparently longer run than the railroads have been willing to make. When traffic and income are low, replacement pressure is also low. The short-run policy of postponing replacements is followed. When traffic is high, replacements become necessary almost without regard to price."

In fact, he said, there is in general a perverse tendency in steel buying. Price advances generate expectations of further price advances and cause increases in purchasing and over-accumulation of inventories. Price declines have an opposite effect.

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CHEMISTRY

Wood Can Be Converted Into Easily Bent Plastic

WOOD can be converted into an easily bent and molded plastic by a new process developed at the U. S. Forest Products Laboratory. Worked into any desired shape while hot, the plasticized wood becomes as stiff and strong as ever upon cooling.

The new treatment is a by-product of the Laboratory's research on the chemical seasoning of refractory woods. During the experiments it was found that oak, soaked in a concentrated solution of urea and then dried, became plastic when heated to about the boiling point of water, though the wood was still dry. It remained plastic while hot, and resumed its normal "woodenness" upon cooling.

Sawdust and chips, similarly treated, can be heated and pressed into any desired shape. This material is self-bonding, that is, it sticks together without the addition of any outside adhesive.

Thus far, the new process has been used principally on hardwoods, particularly several species of oak. However, preliminary experiments indicate that softwoods like juniper and Sitka spruce will also give good results under the same treatment.

Patents covering the new process have been applied for by the Forest Products Laboratory.

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Chemical substances of the human body—proteins, fats, and carbohydrates—are constantly changing with rapidity hitherto undreamed of, says a biochemist.