

Since most previous studies used samples taken over a short time, we compared rates of fetal movement recorded automatically with the 4-hour samples and daily rates. In all cases, samples ranging from 30 to 200 minutes were not representative of the daily rates. The 4-hour samples were closest to the daily rates. There did not appear to be any systematic relationship between the mother's activity and changes in daily rates, 4-hour rates, or automatically recorded rates of fetal movement.

Because the mother's report was commonly used in earlier studies, we assessed the accuracy of such reporting by having each mother estimate how many movements had occurred during automatic recording either at home or in the laboratory. Even the most accurate mother had greater than 10 percent error in 57 percent of her

estimates. The similarity in behavior of all fetuses is evidence that a direct and continuous account of fetal development is possible with our method.

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References and Notes

1. G. R. Schmiedler, *Child Develop.* **12**, 63 (1941); L. W. Sontag, *Amer. J. Obstet. Gynecol.* **42**, 996 (1941).
2. J. Bernard, *Child Develop.* **35**, 1243 (1964); C. E. Walters, *ibid.*, p. 1249.
3. C. B. Ferster and B. F. Skinner, *Schedules of Reinforcement* (Appleton-Century-Crofts, New York, 1957).
4. C. E. Walters, *Child Develop.* **36**, 801 (1965); H. Newberry, *J. Comp. Psychol.* **32**, 521, (1941); T. W. Richards, H. Newberry, R. Fallagatter, *Child Develop.* **9**, 69 (1938).
5. We thank Betty L. Walls and Dr. B. J. Masterson for assistance.

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Economic Meaning of a Labor Shortage

Keynes pointed out that in a laissez-faire economy geared to a high level of investment spending, population growth, via its effect on investment, might be an important factor in maintaining prosperity. He also showed, however, that fiscal and monetary policy could be used to counteract fluctuations in private investment and thus maintain a generally high level of income and employment whatever might be happening to population growth.

Now a new concern is being voiced: Without population growth, crippling labor shortages may develop. According to Boffey's report (1) on Japan's Population Problems Inquiry Council, "the recommendations are aimed at alleviating some potentially serious economic and social problems that are related, at least in part, to Japan's success in curbing its population growth. One such problem is a worsening labor shortage that threatens to undermine Japan's 'economic miracle' . . ." It might seem that the relation between population growth and labor shortage is a simple one: Rapid growth assures an abundance of labor; slow—or negative—growth creates a shortage. Actually, the relation is more complicated.

In the "short-run," Keynesian sense, a shortage—or surplus—of labor is a result of the relation between aggregate demand and aggregate supply in the

economy. Since aggregate demand can be altered by appropriate fiscal and monetary measures, it follows that we can always create, or relieve, a labor shortage. Recent U.S. history provides an interesting example: From 1957 to 1963 the growth of the labor force was relatively slow (800,000 per year), while labor was relatively abundant (unemployment averaged 6 percent). Since 1965, labor force growth has been much larger (1,600,000 per year), but until quite recently the labor market has been unusually tight (3.7 percent average unemployment). Now, in the interest of combating inflation, the Administration is using fiscal and monetary policy to create a bit more of a labor surplus.

"Labor shortage" can also be used in a "long-run," or structural, sense. Instead of the relation between aggregate demand and aggregate supply, what is involved in this concept is the relation between the supply of labor and the supply of capital. If capital is growing rapidly, while labor is growing slowly, or not at all, labor will be scarce and wages will rise more rapidly than would otherwise be the case. It should be obvious that in this sense a shortage of labor is the same as an abundance of capital. Surely no democratic government, if it understood clearly what it was doing, would attempt to keep

capital from becoming more abundant relative to labor.

That a shortage of labor is nonetheless looked on as a threat to a nation's economic health is the result no doubt of a failure to distinguish between per capita and overall expansion. It is true, of course, that Japan's total gross national product (GNP) can expand faster if the labor force grows than if it does not. But aside from military considerations—themselves of dubious validity in a nuclear age—the objective of policy should be expansion of per capita not of total GNP. And per capita GNP will be higher, generally speaking, the larger the amount of capital there is for each person to work with. The case for considering per capita rather than total GNP is especially strong in a country like Japan where overcrowding is already acute and where the negative effects of expansion on the quality of life, which are not included in the conventional measure of GNP, are in consequence especially large.

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Reference

1. P. Boffey, *Science* **167**, 960 (1970).
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Interference in the Lowry Method for Protein Determination

In view of the widespread use of the Lowry method for determination of proteins (1) and the increasing popularity of Good's buffers (2), we feel that certain incompatibilities between the two should be recorded. In the Lowry reaction, some of the commercially available buffers and some analogous compounds give color in the absence of protein; among them are (3) HEPPS, HEPES, and Bicine, and to a much lesser degree BES, PIPES, ADA, ACES, MOPS, glycine amide, TAPS, and CAPS. This color has the same absorption spectrum as the color produced by protein. Five micromoles of HEPES is equivalent to 300 micrograms of bovine plasma albumin.

Some of the buffers, in addition to giving color, prevent the formation of the normal amount of color by proteins, for example ADA, Tris, Tricine, and TAPS. The buffers MES (pK_a at

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