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Progress and Poverty 1969:

The Contribution of Jay W. Forrester

Jerome S. Medowar

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JAY W. FORRESTER, an electrical engineer, is a professor at the Massachusetts Institute of Technology. He became interested in corporate economics and devised a plan whereby the internal functioning of businesses could be studied through the use of a digital computer. Applying the same techniques to the internal functioning of the city, he published *Urban Dynamics* (M.I.T. Press) in May, 1969.

Through the use of a digital computer it is possible to deal with the complexities of the modern city and to determine what causes it to grow, mature and stagnate. In order to employ a computer in analyzing complex urban systems the author simulated a model city. The history of the United States was recreated in the model, with the assistance of politicians, city administrators, teachers and experts in urban affairs. New values were used to analyze emerging circumstances for as long a period as 250 years, the point where a city reaches stagnation.

The process is not simple, in fact the rate variable for incoming underemployed alone, is regulated by 31 different feedback information influences. However, Professor Forrester sets forth the principle that intuitive and reasoning processes based on cause and effect have no application and are wrong most of the time, since cause and effect

relationships are generally only coincidences in a complex system.

For instance, the experts assume that increased job opportunities will alleviate the condition of the poor, but the model shows that the availability of more jobs drew more poor to the city and created crowded slums, resulting in a decrease of new enterprise and mature business and an increased need for taxes.

It is believed by most of the experts in the urban affairs area that housing programs offer the greatest opportunities for overcoming the urban dilemma. Professor Forrester's computer runs indicate that these programs, aimed at ameliorating conditions for the underemployed, have increased unemployment and reduced upward economic mobility from underemployed to labor. A low cost housing program, his model showed, would at the end of 50 years result in a population decline of skilled workers of 30 percent, at which time there would be fewer jobs and less housing for the poor and less new business.

Although the author repeatedly refers to this process as being experimental, he draws a number of conclusions:

The city is and should be master of its own destiny. Revival must come from within. Outside help will be of short term only. Outside money can help very little - the problems may respond by growing in size and difficulty to match any available financial support. The goal is to restore economic vitality and absorb the present underemployed groups into the mainstream of productive activity.

The tax structure tends to penalize those who can contribute most to the well being of the city while favoring those who generate costs. Therefore the city attracts those who pay least and encourages those to leave who pay the most. On the short term this seems humanitarian but on the long term it hurts the poor. If industry is overtaxed it may move out of the city, and since industry requires less public service than homeowners, taxes should be shifted away from it.

There should also be a reconsideration of property rights. "Do the property rights of the landowner include the right to generate decay which blights the entire urban system?" Professor Forrester believes the owner should be encouraged to take self protective actions that generate renewal. He states that transportation can encourage land separation into large non-intercommunicating sectors, resulting in increased commuting costs, psychological trauma and time lost from productive activity.

It was Henry George's belief that the community by its presence and activity gives rental value to land, and that property which benefits from community presence should bear the brunt of taxation. This would in itself encourage the user of land to put it to its highest use.

Proper land usage with emphasis on owner self generating renewal can be brought about through land value taxation. This will lead to the full use of available land and will eliminate crowding while at the same time limiting suburban sprawl. Proper land use would make long distance commuting unnecessary and modern transportation would not lead to urban blight as indicated by Professor Forrester's computer runs. This would be economically unfeasible due to tax structures.

As pointed out in *Urban Dynamics*, industry, the substance that runs through the veins and arteries of the community, must be encouraged. It was George's belief also that the checking of production was the vehicle that led to depressions, want and poverty. Through land value taxation industry is relieved of taxation and at the same time capital investors and workers receive their full interest and wages free of restrictive taxation.

If the time has come to subject Henry George to the test of the computer age, Professor Jay W. Forrester's method may be worthy of study.