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TAXATION TO MAKE JOBS BY ACTIVATING WEALTH

by

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Introduction: The Paradox of Surplus Labor, Shortages and Inflation

"Though custom has dulled us to it, it is a strange and unnatural thing that men who wish to labor, in order to satisfy their wants, cannot find the opportunity." "There can be no real scarcity of work ... until human wants are all satisfied." Today, nearly a century after Henry George wrote that, we are armed with econometric models, staffed with advanced theoreticians, enlightened by nearly 40 years of the New Economics -- and right back at Square One. Federal fiscal and monetary policies have proven powerless to soak up surplus labor, even when allowed to create two-digit inflation. Prominent economists seem confused and helpless faced with the most basic malfunction of the system, that is shortness of work along with short supplies and soaring prices, and we are at once overwhelmed and diverted by the spawn of derivative evils. Why cannot these idle persons find work to fill those shortages? If economics cannot solve this elementary but stubborn riddle, it is not good for much.

Nor is a job what it used to be. United States wage rates have lost ground since 1960 compared to many countries,¹ even as we who used to soak up displaced world labor, have reached out to control and exploit raw materials of others.

¹ Business Week, September 9, 1972, p.114, citing data from U.S. B.L.S. Wage rates have risen faster in Japan, Italy, Germany, Britain and France. The data are for wages before taxes. U.S. payroll taxes have also risen in this period.

* The writer is deeply grateful to Resources for the Future, Inc. for its support of more detailed research along the lines sketched out here.

At the same time the other sinews of production, capital and land, are growing short, and very dear. Materials prices are soaring, even though the social cost of primary products is higher than the price because of massive tax benefits and other subsidies. The required complement or duty of land and capital per worker and consumer has risen sharply for many years, much faster than the work force. So now we are bumping into the ineluctable logic that if we require a vast complement of resources per worker, and require jobs for all, we will chew up lots of resources, and push on the limits of Earth. We will push up materials prices; we will pollute the environment; and we will provoke our neighbors by coveting their raw materails. We will push on the limits of our capital supply too, unless it grows faster than it has been.

If we look to science and innovation to save us, these are mainly harnessed to the goals of saving labor, and using more land and capital to do it. Some, indeed, have revived the themes of Ned Ludd, John Henry, and Karel Kapek, and blamed unemployment fatalistically on science and innovation out of human control. While this vogue has happily abated for the nonce, it is true enough that Science has been in the saddle for a long time without meeting the present problem.

Along with short work we face a swelling array of derivative evils: crime, alienation and counter-culture, protracted apprenticeship periods, soaring welfare and dependency, frustration of idle housewives, forced early retirement, geriatric ghettos, imperialism to make jobs and acquire raw materials, weapons constituencies, other pork-barreling, glorification of waste, slowdowns, featherbedding, fear of change, stunting of creativity through grasping for tenure, seniority and security, suppression of competition, exclusionary local codes and zoning, loss of flexibility and mobility, and rejection of the free market. All these evils have their independent roots in human weakness, but are inflated by unemployment and the fear of it.

Some unemployment is iatrogenic, i.e. caused by the doctor. Critics of welfare point out how welfare payments have

boomed into a cause of unemployment. Since work shortage also serves to rationalize welfare, we have a vicious circle. But there is little doubt which came first, nor is there much doubt that we can solve the problem humanely only by opening more jobs, regardless of the direction of welfare reform.

Each of the derivative evils, like welfare, could be a study in itself. Yet until we face the elemental riddle at the fountainhead of all this trouble, each such study only diverts us from meeting the ultimate challenge for economists that George defined in 1879.

The failure of fiscal and monetary policy, in which we once had such faith we talked of "fine-tuning", is by now so notorious we can merely postulate it as a premise. The New Economics foundered as it steered between the shoals of inflation and the rocks of unemployment and ran onto both at once. The New Economics taught that that would not happen. "Fiscal Policy and Full Employment without Inflation" was Samuelson's promise¹ in 1955, and the world believed it. He wrote of the new "mastery of the modern analysis of income determination", and the "momentous Employment Act of 1946 ... to fight mass unemployment and inflation". Inflation could result mainly only from "overful employment"². All that has turned to ashes in the crucible of 15% inflation.

And yet the New Economics is what taught the generation now in command, and economists of influence seem capable of little but following Pavlovian responses learned in school twenty years ago. In a word, the way to make jobs is recycle money faster: most of what we call macroeconomics today is an embroidery on that one simple theme, the simplicity hidden beneath elegant variations and elaborate circumlocutions that dazzle and boggle and addle without adding much substance. When the basic trick fails, the frills collapse and the performer is left center stage without a line or cue.

¹ Paul S. Samuelson, Economics, 3rd Edition, (N.Y.: McGraw-Hill Book Co., 1955) p.336

² Op. Cit. p.350

The New Economics, when new, was positive and optimistic, and promised a lot. There were free lunches in those days -- when you put the idle to work, there is such a thing. The Puritan ethic was the goat, obsolete and absurd. But now the New Economics has become a New Dismal Science, a science of choice where all the choices are bad. "One must face up to the bitter truth that only so long as the economy is depressed are we likely to be free of inflation". (Samuelson, 1970)¹ "No one in the world has a recipe for correcting our price performance without some unfortunate increase in unemployment." ... the public "should be told the facts of life." (Arthur Okun, 1970)² This is not bread, but a stone.

Conservatives are not offering more. " ... there is no other way to stop inflation. There has to be some unemployment. ... It is a fact of life". (Milton Friedman, 1970)³ "The election will show whether the American people are mature enough to accept a sustainable (low) level of activity." (Henry Wallich, 1970)⁴ " ... this economy can no longer stand a real boom with low levels of unemployment without kicking off a rampant inflationary spiral." (Alan Greenspan, 1972)⁵ Thus it seems that conservatives unite with liberals in seeing the choice as a trade-off on a Phillips Curve, and differ mainly in preferring to disemploy more and inflate less. There is little challenge to the conceptual framework. Controlling spending is where it's all at. Monetarists debate Keynesians over the most effective way to regulate spending, and are more disposed to favor less of it, and recognize other constraints. Yet neither side much deviates from the premise that spending money is the governor of the economy, the autonomous force which other activity obeys, the key of control. "The collective intelligence of the economics profession is unable to fundamentally restructure the intellectual substance of the field ... We have a

1 "Nixon Must Alter his Game Plan", Washington Post, Aug.23, 1970 p.G1.

2 Inflation, (Wash.: The Brookings Institution, 1970) p. 9

3 New York Times, Dec. 1970

4 Newsweek, April 20, 1970, p.91

5 "The Budget is the Spur", Newsweek, January 31, 1972, pp.63-64

theoretical apparatus that can be used for a wide variety of things. There is no other one, and I do not think we know how to find one." (Otto Eckstein, 1974)¹.

Yet, along with the policy failures, there are intellectual substances and theoretical apparatus one can identify which are clearly wrong, and must interfere with any effort to make jobs. Modern macroeconomics evolved under a very different set of problems than we face today, and its founders built into its very vitals a number of special premises and limitations. It is geared to assume no or few resource constraints, and has little response for the new challenges of environment, scarce raw materials, and anti-growth-manship. "Growth", indeed, is one of its ideals, and simply to make jobs in a stable equilibrium independent of growth is outside its purview. Geared to approve waste, it has nothing for emerging needs to conserve scarce resources. Geared to define the economic problem as how to dispose of surpluses, it ill becomes a world of excess demand and short supplies. Geared to treat capital as a glut, and the central economic problem as how to dispose of excess saving, it is at a loss with high interest rates and capital shortage.

The falling rate of profit is built into the apparatus, and even as we go to press in August, 1974, Samuelson is still disputing that capital is really short.² Geared to treat both resources and capital as cheap, it all too easily lets labor be treated as the only cost of production worth mentioning -- a new labor theory of value -- ignores distribution, and plays into the hands of anti-labor interests by picturing the economic scene as a continuous "wage-price spiral". It ignores the possibilities of substituting labor for land and capital. Geared to idealize federal spending, it drifts easily into mercantilism and imperialism, especially in the more idealistic, missionary face of AID and "economic development". Geared to accept and live with concentration of wealth and economic power, it has little to say about the effects of industrial mergers in substituting capital for labor by putting

¹ "Resharpener the Tools", Business Week, January 5, 1974, p.56

² "Capital Shortage, or Glut?", Newsweek, August, 1974, p.73

plants on standby and laying off workers. It has no basis for not condoning the monumental waste of capital in urban sprawl, or the global sprawl of imperialism, because each inflated need is an investment outlet.

In the apparatus of modern macroeconomics, it is built in that the best way to recycle stagnant money is to find investment outlets. Since the rate of profit is always threatening to push zero, such outlets are to be cherished, and we should subsidize and force-feed investment if needed, as by loans at low interest, to keep that money recycling. If we stack up layers of capital at low productivity, that is no problem. Seminal investments like roads and water supplies that open new lands are best of all for they want multiple ancillary or induced investments, which recycle yet more stagnant money. Boondoggling is all right because it makes jobs, and if it soaks up a disproportionate quota of capital per job that helps dispose of excess saving. Anyway, capital shortage is only a problem for the long run when we are all dead. Initially, every dollar invested creates income, and after that consumers recycle the money again, regardless of the type of capital created.

The result of this attitude has been to let a thousand policies bloom which foster substituting capital for labor. This finds support from some other errors or half-truths left over from the old economics, which die very hard.

One of these is to define "efficiency" as output per worker. Only very recently, with the birth of the concept of total factor productivity, and the new emphasis on energy-efficiency, are most economists beginning to escape this perverse concept with its built-in bias against use of labor.

Substituting capital and land for labor raises "efficiency", so conceived, only by wasting capital and land, and is only efficient in unrealistic models in which land and capital are underpriced, or ignored. High labor-efficiency then means low land-efficiency and low capital-efficiency, either directly or at one remove

in the form of low energy-efficiency, low water-efficiency, low feed-grain efficiency, etc.

Misled by this concept we have exulted in high output per man as a symbol and measure of national and company success, and accepted an extreme substitution of capital and resources for labor. The well-known displacement of farm labor is not an exception, but more like the rule. John Kendrick calculated that the ratio of capital to labor for a large group of industries in the United States rose at an average annual rate of 1.3% from 1899 - 1953.¹ That means a 100% increase over that 54-year period. More recently, the United States Department of Commerce studied non-financial corporations, 1948 - 1971. It found capital inputs growing at 4% yearly compounded and labor at 1.2%². That means there was 2.5 times as much capital in 1971, with 1.3 times as much labor, or 1.9 times as much capital per worker in 1971. Thus the rate of substitution seems to be increasing.

And that's not really the half of it. These studies omitted the public sector, the infrastructure into which we have poured so much public treasure at low interest rates. They omitted housing, which soaks up so much capital per job created. They omitted the recreation boom which requires so much more land and equipment per consumer hour, and per measure of personal joy, than the quiet pleasures of yesteryear. And they omit the swing of consumers toward goods and services like electric power and natural gas, whose production is capital-intensive, and whose prices fall relative to labor-intensive products when the capital input is subsidized. Producers also use much more of these as inputs. A primary metal like aluminum will consume 135 kwh per dollar of value-added, compared to 10 - 20 in a normal manufacturing operation. It is energy-inefficient and thrives only on underpriced energy, thanks to which it is cheap relative to competing materials. For years we have been substituting energy for labor and calling it progress and

¹ John Kendrick, Productivity Trends in the U.S. (Princeton: Princeton Univ. Press, 1961) pp.148-149, Table 39

² Cited in "The Push to get More from Men and Machines", Business Week, September 9, 1972, pp.80-81

efficiency, only to find that energy is scarce and labor surplus. A comprehensive accounting of our lavish input of capital and land per worker would reverse the common stereotype that labor invented featherbedding.

The second supporting ancient half-truth is that capital cannot really displace labor, in a vertically integrated whole economy, because labor produces capital anyway. This is the counterpart of the modern macroeconomist's concept that investment employs labor. Either way you perceive it, the meaning is that benefits to capital are passed through to labor.

That is a half-truth, and the untrue half has helped lead us into our present crisis. The problem is that capital can substitute for labor. It is a problem that neo-Georgists, in their zeal to untax capital, have overlooked as well.

Keynesians and Georgists have this in common. Keynesians say investment creates jobs and Georgists say labor produces capital. Keynesians would subsidize investment and Georgists would untax capital. Many Keynesians would untax or downtax the income from capital, too, Keynesians focusing on the income tax and Georgists on the property tax. The investment tax credit, expensing of capital investments, accelerated depreciation and exempting imputed income of homeowners are the income tax credit counterparts of exempting buildings from the property tax. Jack Stockfish had the insight to point out years ago that these Keynesian inducements to invest were Georgist ideals applied to the income tax.¹ Both schools share the idea that benefits to capital are benefits to labor.

But a great deal of the cash and service flow from capital imputes to capital as such, as interest. The longer the

¹ Jack Stockfish, "Investment Incentive, Taxation, and Accelerated Depreciation", SEJ 24(1): 28-40, (July 1957), p. 38. Since land is not depreciable, these tax preferences theoretically do not apply to land income. In practise, however, land income is as sheltered as capital income. [Mason Gaffney, The Treatment of Land Income, Economic Analysis and the Efficiency of Government, (Joint Economic Committee, Congress of the U.S., 91st Congress: 1st Session, Part 2, 1970,) pp. 405-415.] Keynesians have not been at all alert to this problem.

life of the capital item, generally, the larger share that is. A great deal of interest is internalized and invisible, hence too easily overlooked and forgotten. But a couple of simple examples should make the point.

When one buys a durable good on the instalment plan, if the payments stretch out beyond fifteen or so years more than half the total is interest. Just how many years depends on the interest rate and the term, but at say 10% over a twenty-year term the yearly payment required is 11.7% of the principal. Twenty times 11.7% is 2.34. Since the principal is one, the interest is 1.34. So, $1.34/2.34$ or 57% of the payments are interest.

Thus the cost of a mortgaged house, or a debt-financed highway, or a debt-financed war can be mainly interest. But even if these are not debt-financed, they cost interest -- the interest foregone on the equity capital, for they are simply financed with owned instead of borrowed capital. The relevant "term" is how long the capital sunk is tied up before being fully recovered. "Recovery" is the residual after deducting interest from cash or service flow, and may be very slow and even negative when interest rates are high and cash flow low.

A house thus "financed" over 60 years at 10% requires yearly level payments of 10.03% of the principal. Sixty times 10.03% is 6.02, so $5.02/6.02$ or 83% of the payments are interest. Accordingly, it is understandable that housing starts are more sensitive to financing than to any other cost.

But note now how little of the salable service flow is produced by labor. It would only be $(100 - 83)\%$ or 17% even if the entire construction bill were for payroll. In fact, of course, on-site labor is only 20% or so of construction cost. Materials like lumber take another big chunk. But lumber comes from trees which take decades to grow. One dollar invested in forest regeneration must double every 7.2 years to yield 10%, so if lumber comes from second-growth cut at age 9×7.2 or 65, stumpage of \$2⁹ or \$512 embodies \$1 of planting labor and \$511 of compound interest. Of

course harvesting, hauling, milling and selling apply more labor to add value, so lumber value embodies a higher share of labor value than timber alone. Still, timber is a splendid second example of capital-intensity where it is largely capital, and not labor, that produces capital.

Timber growth is a good example of "passive investment". It is internally financed in the most literal way. Each year's growth is a product, an income to the owner, which he automatically invests in growing stock, adding to capital. But this investment employs no labor. It only employs capital and land, i.e. growing stock and site. Mature timber, finally, has not been produced by labor so much as by capital -- the young growing stock -- and land.

Preferential tax treatment for timber, then, is a good way to make work for capital but a bad way for labor. Capital-gains treatment of timber sales, expensing of interest and property taxes, and preferential low property tax rates and assessments for timber tie up capital in the slowest of cycles and fence off land from labor, except once a century or so when the crop is cut. The job-creating efficiency of capital frozen this way is very low.

A third ancient error is that it takes a fixed quota of capital to "create" a job, visualized as a kind of niche made of capital in which we place one worker. The weekly ads of Warren and Swasey pound this theme recurrently, and Norman Ture, writing for the National Association of Manufacturers, has dignified it with an economist's formality.¹ If the premise were true, of course, then the way to make jobs is create capital, case closed. And surely capital is a wonderful, useful thing. But in fact, factor mix varies over a wide range, and policies which are more certain to raise capital needs than capital formation are not a way to make jobs. Capital is capable of complementing labor, but the extent to which it actually does so depends entirely on how it is invested and used, and cannot be assumed. The value of capital

¹ Norman Ture, Tax Policy, Capital Formation, and Productivity (N.Y.: National Association of Manufacturers, 1973). The whole case made by Ture rests on assuming that capital complements labor, an assumption built into the Cobb-Douglas function. See his p.14, "The Law of Diminishing Returns".

to labor depends on how active the capital is. Looking ahead, we will see that each time capital is recovered and reinvested it can recombine with and reactivate labor, but torpid capital like that in trees, and many public works, and premature exploration, and so on is withdrawn from abetting labor. It may preempt land as well, just as the landlords' sheep did in 16th century England.

In the growth models of and following Harrod and Domar New Economists have been quite comfortable with assumed constant ratios of capital to output. Growth was linked closely with capital formation. This harmonized nicely with the Warner and Swasey assumption. It all served to reconcile the Marxist streak in the New Economists with the puritanism of capitalists. The New Economists viewed growth as an escape from the doom of oversaving; the capitalists saw it as their social duty which rationalized and helped aggrandize their functions, prerogatives, incomes, wealth and status. It has been a curious but powerful partnership, hardly challenged until it brought us double-digit inflation.

It has had to exclude, however, from its intellectual substance and theoretical apparatus the good news buried in a few obscure pages of Wicksell¹, that capital can increase its "valence" (to borrow a chemical term) for labor easily, and combine with more or less, in response to relative prices. We may not need to find a new theory, but resurrect one, and cast out some fallacies.

Like any entrenched system, the New Economics was unassailable when things went tolerably well, regardless of its merits. Now that its single-minded preoccupation with purchasing power as the job-maker is inflicting us with intolerable inflation, and failing to make jobs, it is time to review and reconstruct. The New is now old. It had to break down because it was superficially based. The suffering is not welcome, but the opportunity for review is.

Faced with a surplus of labor and a shortage of land

¹ To be cited below

and capital, an obvious way to adapt is to substitute labor for land and capital, at the margins of course, making all processes more labor-using. Thus we would increase the use of labor without pushing on the limits of Earth, without invading others' land and without needing more capital.

It is not a question of stopping growth. There is no need to divide into factions for and against growth. We can grow by combining more labor with the same land and capital. It is simply a matter of modifying processes and products and consumption¹. Each time the capital recycles it can embody new techniques as well. Growth of capital is not needed for progress; turnover is. And since the way to substitute labor for capital is to turn over capital faster, this also accelerates embodiment of new knowledge in real capital.

This study develops a thesis that we can employ ourselves as fully as we wish without any of the unpleasantness we now suffer in the name of jobs: without inflating, without borrowing, without fighting, without polluting, without any compulsion to "grow", "develop" and expand, without wasting, without price and wage controls, without invading more wilderness, without impoverishing posterity, without socializing labor or capital, without dirigisme, without giving up freedom, and without overspilling our national boundaries. Economic policy can offer better than dismal choices.

The problem is too much displacement of labor. It is "too much" because it results from biased institutions, a large set of them, operating over many years, which artificially induce substituting land and capital for labor. The way to solve the problem is to identify and remove the biases. This will increase demand for labor without requiring any more resources or capital.

No special rate of growth is required. We simply need to grow (or even not grow) in such a way as to combine each worker

¹ The research group at Resources for the Future has devoted years to belaboring this point in respect to pollution control. The object here is to generalize the point to the whole economy.

with less land and capital than now; to run with a leaner mixture of wealth, richer of labor.

There is no need to go any further and reverse the bias in favor of labor. The operation of a free market with flexible prices to serve as equilibrators should do the job -- we will look more specifically at the process later. The idea is to make jobs not by waste, but in the very process of mixing inputs more efficiently. This is the very sort of thing that a flexible economy can do -- this is why they invented the free market. Just as the United States could retool for war quickly back in 1942, given the will, now we can retool for new jobs quickly given the will, the freedom, and a certain know-how in framing public policy.

We will also see that substituting labor for capital, seemingly a "structural" change in another world from that of macroeconomics with its aggregate supply and demand, refuses to stay in its pigeon-hole. It entails faster recovering of capital, and faster ripening of capital into final goods. The first increases the rate of reinvestment; the second the flow of consumer goods. Thus the structural substitution is also a macroeconomic effect of the most central kind, neglected though it has been by macroeconomists.

Let us see how those matters fit into the concerns of the Committee on Taxation, Resources and Economic Development, and other neo-Georgists. One set of institutional biases against labor is in tax policy -- and I am limiting this paper to that set. These taxes affect the way we develop resources. In its founding articles the Committee expresses a concern for how land taxation affects employment. It has focused on other aspects of its work, which was desirable to build a base of expertise, but is all the more reason for compensating now and building on that base to achieve the original, more ambitious goals.

The original high interest in land taxation as expounded by Henry George has never been matched since. George did not write primarily on municipal finance, important as that is. The problem

he posed was more cosmic and gripping, the association of poverty with progress; of "industrial depression; of labor condemned to involuntary idleness; ... " That is, George addressed the same problems as Keynes and the New Economists. He said these resulted from an artificial scarcity of land. Like Keynes, he thought positively. He did not hand us another dismal iron law of inevitable suffering. He pointed to a solution -- we could thaw the frozen land, the passive factor, by taxing it, and employ labor, the active factor, by untaxing activity and labor and its products, i.e. capital. He said there was no limit in a truly free economy on jobs, other than human desires for the fruits of work. This theme commanded attention because that was the problem needing solving, even as today. In the more evolved lexicon of modern economics we would say he favored "changing factor proportions" or "substituting labor for land", but that would not change the substance or the importance.

Again like the New Economists, George was weak on capital theory. He ran labor and capital together, seeing their interest as one and set off against landowners'. He overlooked the substitutability of capital for labor, that which looms so large in Austrian School economics. Keynes and George alike treated the Austrians as their natural enemies, an unfortunate and needless impoverishment of their respective philosophies.

The oversight in George was not so serious, because he wanted to untax labor, not just capital. The oversight by neo-Georgists is serious, because their emphasis has been largely on untaxing capital. But if we untax capital and continue to tax payrolls we stack the cards against labor, we bias the system to substitute capital for labor.

It is important, as George said, to use more workers per unit of land and primary products. It is also important, as he did not say and we are in mortal danger of overlooking, to use more workers per unit of capital. To support that thesis, I have four points in what follows.

A. Factor mixes vary over a wide range and are by inference sensitive to relative costs and other stimuli like tax bias.

B. Tax bias force-feeds land and capital into the production mix but militates against labor.

C. Demand for capital is not a sufficient or even necessary condition to make jobs. It often helps, but there is a trade-off in the factor mix between labor and capital. Using labor for capital entails applying labor more frequently, and this is also an aspect of using labor for land.

D. Using labor for capital means recovering and replacing capital oftener, which increases aggregate demand for labor, as well as the flow of consumable goods and services so long as there is surplus labor to employ.

Based on that analysis we can then see how to invest so as to put capital where the jobs are, to invest so the "job-creating efficiency", if you will, of capital and land is higher -- not a maximum, but an optimum where idleness is only voluntary and the amount of capital suffices that people save voluntarily. And we can finally mention what tax policies would serve to remove the present bias.

A. Factor mix is sensitive to factor prices

We can make more jobs by using more workers (W) per unit of land (L) and capital (K). That this is feasible is suggested by showing that the mix of factors already ranges widely, that some employers already mix enough workers with their land and capital to employ everyone if only most other employers were moved to act a little more like them. That which needs doing is already being done, it just needs to be done more. We will identify some of the kinds of firms and employments that use more labor in the mix, i.e. a high $W/(L + K)$. Then we can see how to stop penalizing them, and get more like them.

The goal is not to make work for its own sake. Where the "job-creating efficiency" of wealth is higher, the goods-creating efficiency is higher, too. We will show one can produce many times more from the same land by applying more labor, and without wasting labor.

The most ancient, basic and self-evident of economic relationships is that between land and opportunity. Tribes and nations have warred over control of rich and strategic land, and we are still at it. But more perceptive observers, of whom few could match Adam Smith, have noted that the value of the resource to labor depends on how actively the owners use it. "In plenty of good land the English colonies of North America ... are ... inferior to those of the Spaniards and Portuguese ... But the political institutions of the English colonies have been more favorable to the improvement and cultivation of this land ... First, the engrossing of uncultivated land ... has been more restrained in the English colonies than in any other ... The plenty and cheapness of good land ... are the principal causes of the rapid prosperity of new colonies. The engrossing of land, in effect, destroys this plenty and cheapness. The engrossing of uncultivated land, besides, is the greatest obstruction to its improvement."¹

Henry George gave this theme center stage in his philosophy, attributing unemployment to speculative withholding of some land from use. Labor needed access to land. It had access to some lands, but these were oases in the speculative desert. Today we call this "urban sprawl" or "scatteration", essentially a condition of extremely different intensities of use on neighboring lands, and a common one as we know. Smith and George wrote in black and white contrasts. More generally, land is fallow, "engrossed", or "held in speculation" by degrees, and in this sense sprawl and scatter are the universal condition.

Economists seem well aware that factors blend and mix in a range of ratios. The principle of variable proportions is well preserved by text writers, if only in formaldehyde. It lives when economists criticize engineers for taking a fixed "requirements" approach to the alleged "need" for some input like water or power by firms or consumers. Economists speak of tradeoffs, choices, and substitution in response to prices and incentives. They publish data on changes over time, as that cited above, (although regrettably

¹ Adam Smith, Wealth of Nations. New York: Random House, 1937 pp. 538-540

one reads twenty times of declining capital to output ratios for once of rising capital to worker ratios). They note the contrast among nations and regions resulting from different relative prices: more labor per log in European than Canadian sawmills; more labor per acre on Japanese than Argentine farms; more capital per acre-foot of water in the citrus groves of arid Tulare County, California, than the rice fields of the Sacramento Valley. They have noted that larger companies and governments tend to favor more capital-using techniques.

They have been less good about attributing some of these contrasts to institutional bias. There is a strong positive relationship between belief in tradeoffs and devotion to the price system, and too often these contrasts of factor mix are adduced to rationalize the price system when in fact they display the bias of institutions like taxation.

They have been no good at all about working all this into macroeconomics which is supposed to help us make jobs. Labor is treated almost as the only cost, so wage cuts (remember when people discussed them?) would only lead to vicious downward spirals, and wage boosts can only be shifted forward in vicious inflationary spirals. Since factor price flexibility up or down is vicious, the only way to make jobs is by "growth", with a fixed requirement of capital per job as in Harrod-Domar models. There is no thought of making jobs simply by enriching the mix with more labor -- that would be retrogressive, lowering "productivity", or reactionary and unmentionable because such thinking went out with Hayek¹. There is if anything a sense of Calvinist-Marxist predestination (for they are the same) that forces us to use even and ever more capital per worker. We are left with a theory of compulsive growth.

Worse, when it comes to intensifying the use of land, it often turns out to be other peoples'. We were ready to believe, we always believed, that jobs depended on the frontier, i.e. taking land from the aborigines, and Alvin Hansen integrated Keynesian fatalism with traditional Americana by attributing stagnation in

¹ The 1974 Nobel laureate is obviously no longer "out".

part to the closing of the frontier, Today, many economists are quick to sieze on our loss of cheap foreign oil and other primary products as the killer of jobs. In fact, the frontier was a great sink of capital and the energy industry is too, both in production and consumption.

Frontier expansionism neglects the inner frontier, the intensive use of labor on the land we already have. The old cowboy and sodbuster heroes left grubby conservationist agriculture as an afterthought to immigrants and outgroups outside the mainstream. Current United States Mercantilism, which has it that United States labor depends on foreign resources, overlooks the fact that cheap energy powers the farm machinery that drives labor off the farms, i.e. it combines with capital and land, not labor. Berndt and Wood are finding that energy use is highly related to capital use, not labor, in a comprehensive study of American industry.¹ Note that the "inner frontier" of energy refers not merely or mainly to producing more primary energy domestically, but to combining energy with more labor as we use the energy -- otherwise perceived as economizing on energy.

To be sure, we have urbanized, which looks like intensifying the use of land. Yet instead of really urbanizing the people we have suburbanized the cities -- to the cheering of many economists who see this as an unbiased expression of consumer tastes, freed from central cities by cheap energy and telecommunications. In fact, one could make a case that pollution from autos and the neighbor's television have repelled people from the city as much as pulled them to the suburbs. At any rate in 40 years past we have halved the density of cities. "Intensification" has meant invading farm land, sinking enormous capital into new roads and pipes and lines. Providing urban water usually unleashes municipal hydro-imperialism, as cities range far away to capture remote waters rather than clean and develop near sources. Thus American urbanization replicates the continental frontier and global expansion. We intensify the other fellow's land, and use up our capital prodigally

¹ Ernst R. Berndt and David Wood, "Technology, Prices, and the Derived Demand for Energy", preliminary draft, Dec. 1973, 28 pp. A most perceptive and more general treatment is Sanford Rose "The Far-reaching Consequences of High-priced Oil", Fortune, March 1974, pp. 106-12, 191-96.

as we do.

It would be a mistake then to think that making jobs by applying more labor to land, the policy advanced here, would entail more conversion of farm to city land, more new towns, "developments", shopping centers, industrial parks, and the like, or more territorial expansion or mercantilism. Those generally are aspects of raising, not lowering, the required complement of land per worker.

Here follow some data to illustrate how widely factor mixes range. The data refer to neighboring lands, generally, of comparable quality and in the same markets. The differences therefore display that factor mix is sensitive to shadings of input prices so slight that they are not equalized by the market -- differences internal to families and firms such as result from credit ratings, tax positions, political connections and other institutional biases. For example, an immigrant with many children goes heavier on labor, a speculator with friends in the banks and the Capitol favors lands, while a doctor with income to shelter might invest heavily in depreciable capital.

The first data are from California farming. In the San Joaquin Valley, east side, land is versatile among many competing uses. These range from dryland grazing up to citrus, fresh tomatoes, and berries. Grazing might gross \$15 from the animal units; tomatoes might gross \$1,500 a year, 100 times as much. The specific prices are subject to secular and cyclical and inflationary change, but the basic principles are not: the same land yields a little or a lot, depending on what you mix with it. Table 1 is a crop report gathered by the United States Bureau of Reclamation from its Friant-Kern Canal Service Area. Not all the land is versatile among all the options, but a close study of the area has shown that the margins between the uses are ragged.¹ Almost every area has several options, and many of them are choices between the highest and the lowest gross. Labor's share of gross rises with intensity, defined here simply as nonland

¹ Mason Gaffney, "Diseconomies Inherent in Western Water Laws", in Economic Analysis of Multiple Use, Proceedings of Western Agricultural Economics Research Council, Range and Water Section, 1961, pp. 55-82, 75ff. See also Irvin H. Althouse, "Water Requirements of Tulare County", Report to Tulare County Board of Supervisors, January, 1942 (mimeo), map in back pocket.

Table 1. Crop production, Friant-Kern canal service area.

Crop	Acres	Value per Acre (\$)
Barley	15,696	51.09
Corn	10,490	96.68
Rice	907	167.66
Sorghums	17,279	74.77
Wheat	3,176	87.85
Alfalfa hay	63,460	144.11
Irrigated pasture	17,388	77.66
Beans, dry and edible	4,293	107.14
Cotton, lint (upland)	108,928	352.80
Asparagus	1,383	418.70
Beans (processing)	27	900.00
Beans (fresh market)	75	975.33
Corn, sweet (fresh market)	254	205.91
Lettuce	423	336.51
Cantaloupes, etc.	507	547.02
Onions, dry	686	495.70
Potatoes, early	12,711	366.04
Tomatoes (fresh market)	1,343	881.16
Alfalfa	1,279	151.79
Berries (all kinds)	80	1,215.60
Oranges and tangerines	24,952	915.51
Grapes, table	43,795	545.24
Olives	7,172	327.45
Peaches	6,371	644.38
Prunes and plums	3,288	674.00
Walnuts	1,374	338.14

Source: Sacramento Office, U. S. Bureau of Reclamation, 1958.
Minor crops omitted.

inputs ÷ output.¹ For grazing, this is on the order of $\$6/\$15 = 40\%$. For tomatoes it is more like $\$1,400/\$1,500 = 93\%$.

Of course the return to land from tomatoes is highly leveraged and volatile, as a short-run gamble, but that is not our concern here. Averaging out the good years and the bad, the return to land from tomatoes is very sensitive to wage rates and other costs of hiring like payroll taxes. A slight rise of 7% nearly wipes out the rent; a drop of 7% nearly doubles it. But the same wage changes would only imperceptibly change the returns to land from grazing. Thus a slight drop of labor costs applies great pressure to shift land to tomatoes and other high-yield, labor-intensive crops, making a very elastic demand for labor.

The scope for this kind of change is manifest in the fact that most of California's farm output comes from a tiny fraction of her good farm land, that which is used intensively.

Of the several million acres of irrigable land in California, there were in 1960 21,000 acres in plums, 36,000 in freestones, and 65,000 in navels.² Most of the other land was and is used at low intensities, using little labor to yield only a few dollars worth of barley, alfalfa, forage pasture, hay, sorghum, safflower, rice or cotton.

In irrigated farming water is an indirect land input, since a water right is the right to the water yield of a vast watershed. One might then think the tomatoes really use a lot of land in the form of irrigation water. But in fact the high-grossing crops such as tomatoes, citrus, peaches and berries are modest users of water. Pasture, alfalfa, and rice are thirsty crops, and they yield only \$50 - \$200 per acre, not one-tenth of the high yielders.

The high-grossing crops use more labor per acre not just in the fields, but in the packing houses, the railroads, the stores,

1 This is simplified. The commensurable combining of labor and capital inputs is formularized in Appendix III.

2 G. W. Dean and Chester O. McCorkle, Trends for Major California Fruit Crops, California A.E.S., Extension Service Circular 448, 1960.

and the kitchens. A \$1,500 tomato crop will use more labor at every step to the consumer than a \$15 weight gain on a calf, do it sooner, and much more often. Thus a higher use of labor in the field increases demand for labor beyond the field. Reciprocally, lower costs between consumer and farmer, raising field prices by say 7%, would (in our example) double land returns from tomatoes and increase demand for labor on the farm.

In Iowa, a more uniform state, Shrader and Landgren have calculated that if all farmers followed the standards already practiced by the most advanced farmers, Iowa alone could supply the nation's output of feed grain.¹

Farm land use in general varies so much from farm to farm that "farm sprawl" and "horticultural sprawl" are as common as urban sprawl. But this reminds us that all our cities are dominated by sprawl, which is essentially a condition of extremely different intensities on adjacent lands. Different mixes of land with nonland inputs are not the exception but the rule.

It does not surprise tax economists, of course, to learn about differences of factor proportions, for that is at the heart of the problem of tax enclaves. As everyone knows, localities compete to attract capital-using plants and to repel labor-using ones, and they find large differences among them.

Factor mix also tends to change with size of business and wealth of individuals. As a broad statistical truth, the application of labor to property tends to be regressive. The larger holdings use less labor per unit of property value.

The United States Census of Agriculture ranks farms by value of gross sales. In 1950, "Class I" farms, those grossing \$25,000 or more, had 22% of the land in farms, but 7% of the farm labor. The small producers of course made the figures balance by applying more labor per acre.

¹ William Shrader and N. Landgren, "Land Use Implications of Agricultural Production Potentional", in L. Fischer, ed., Shifts in Land Use. Nebraska Agricultural Economics Service, 1964.

The use of labor on land by and large increases with the improvements there -- not so much in building them, for they are infrequently replaced, but in using them. Farm machines tend to displace labor. Farm buildings shelter and store outputs and inputs and labor itself, complementing labor. From 1900 to 1940 the United States Census of Agriculture reported separately on land and buildings. Table 2 supports the thesis of regressive use of land. (1940 is the latest year available because unfortunately the United States Census then discontinued the series.)

Note that implements and machinery, which displace labor, decline much less with acreage than buildings do.

John Riew presented similar data at last year's meeting of this Committee, from Wisconsin farm counties.¹ Other studies finding this pattern are by Morton Paglin² and Albert Berry³. Don Kanel, Peter Dorner, John Strasma, Philip Raup and several other farm economists have piled up data showing the point.

Turning to "industrial" corporations, the regressive use of labor on property may be inferred from data in Fortune Magazines' yearly report on the largest 500. I tested the thesis by ranking them by "net worth" or invested capital, and calculating profits (after taxes) per employee. Table 3 shows the broad results.

The choice of profits/employee to test the case premises that profits in general are the realized earnings of and some index to the real assets of a firm. In fact, if the larger firms use their property less intensively (as this and other evidence suggests) then their realized profits as an index understate the assets of larger firms compared to smaller ones.

If there is something about size of business that

¹ John Riew, "Assigning Collection of a Statewide Uniform Rate Land Tax", in R. Lindholm (ed.), Property Taxation and the Finance of Education.

² Morton Paglin, "Surplus Agricultural Labor and Development", Am. Ec. Rev., Sept. 1965, pp. 815-833.

³ Albert Berry, "Presumptive Income Tax on Agricultural Land", Nat. Tax. J., June 1972, pp. 169-181

Table 2. Land, buildings, and implements and machinery; average values per acre; by size of farm, 1940.

Size Group (Acres)	Land \$/Acre	Buildings \$/Acre	I & M \$/Acre	As %s of Land Value	
				Bldgs %	I & M %
Under 3	728.00	1,618.00	192.00	222.2	26.4
3 - 9	156.00	225.00	22.00	144.2	14.1
10 - 19	79.00	69.00	8.85	87.3	11.2
20 - 49	41.00	28.00	5.00	68.3	12.2
50 - 99	30.00	19.00	4.59	63.3	15.3
100 - 174	29.00	15.00	4.54	51.7	15.7
175 - 259	30.00	13.00	4.36	43.3	14.5
260 - 499	26.66	8.34	3.44	31.3	12.9
500 - 999	18.50	4.50	2.28	24.3	12.3
1000 & over	8.29	1.13	0.64	13.6	7.7
Total, U.S.	21.90	9.81	2.88	44.8	13.1

Source: United States Department of Agriculture, 1940 Census of Agriculture, Vol. 3, p. 80. Percentages calculated by writer.