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Learning Curve: No Longer Just a Human Trait

By John Markoff, The New York Times, November 24, 2012

Using an artificial intelligence technique inspired by theories about how the brain recognizes patterns, technology companies are reporting startling gains in fields as diverse as computer vision, speech recognition and the identification of promising new molecules for designing drugs.

The advances have led to widespread enthusiasm among researchers who design software to perform human activities like seeing, listening and thinking. They offer the promise of machines that converse with humans and perform tasks like driving cars and working in factories, raising the specter of automated robots that could replace human workers.

The technology, called deep learning, has already been put to use in services like Apple's Siri virtual personal assistant, which is based on Nuance Communications' speech recognition service, and in Google's Street View, which uses machine vision to identify specific addresses.

But what is new in recent months is the growing speed and accuracy of deep-learning programs, often called artificial neural networks or just "neural nets" for their resemblance to the neural connections in the brain.

"There has been a number of stunning new results with deep-learning methods," said Yann LeCun, a computer scientist at New York University who did pioneering research in handwriting recognition at Bell Laboratories. "The kind of jump we are seeing in the accuracy of these systems is very rare indeed."

Artificial intelligence researchers are acutely aware of the dangers of being overly optimistic. Their field has long been plagued by outbursts of misplaced enthusiasm followed by equally striking declines.

In the 1960s, some computer scientists believed that a workable artificial intelligence system was just 10 years away. In the 1980s, a wave of commercial start-ups collapsed, leading to what some people called the "AI winter."

But recent achievements have impressed a wide spectrum of computer experts. In October, for example, a team of graduate students studying with the University of Toronto computer scientist Geoffrey E. Hinton won the top prize in a contest sponsored by Merck to design software to help find molecules that might lead to new drugs.

From a data set describing the chemical structure of 15 different molecules, they used deep-learning software to determine which molecule was most likely to be an effective drug agent.

The achievement was particularly impressive because the team decided to enter the contest at the last minute and designed its software with no specific knowledge about how the molecules bind to their targets. The students were also working with a relatively small set of data; neural nets typically per-

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Learning Curve *from page 1*

form well only with very large ones.

"This is a really breathtaking result because it is the first time that deep learning won, and more significantly it won on a data set that it wouldn't have been expected to win at," said Anthony Goldbloom, chief executive and founder of Kaggle, a company that organizes data science competitions, including the Merck contest.

Advances in pattern recognition hold implications not just for drug development but for an array of applications, including marketing and law enforcement. With greater accuracy, for example, marketers can comb large databases of consumer behavior to get more precise information on buying habits. And improvements in facial recognition are likely to make surveillance technology cheaper and more commonplace.

Artificial neural networks, an idea going back to the 1950s, seek to mimic the way the brain absorbs information and learns from it. In recent decades, Dr. Hinton, 64 (a great-great-grandson of the 19th-century mathematician George Boole, whose work in logic is the foundation for modern digital computers), has pioneered powerful new techniques for helping the artificial networks recognize patterns.

Modern artificial neural networks are composed of an array of software components, divided into inputs, hidden layers and outputs. The arrays can be "trained" by repeated exposures to recognize patterns like images or sounds.

These techniques, aided by the growing speed and power of modern computers, have led to rapid improvements in speech recognition, drug discovery and computer vision.

Deep-learning systems have recently outperformed humans in certain limited recognition tests.

Last year, for example, a program created by scientists at the Swiss AI Lab at the University of Lugano won a pattern recognition contest by outperforming both competing software systems and a human expert in identifying images in a database of German traffic signs.

The winning program accurately identified 99.46 percent of the images in a set of 50,000; the top score in a group of 32 human participants was 99.22 percent, and the average for the humans was 98.84 percent.

This summer, Jeff Dean, a Google technical fellow, and Andrew Y. Ng, a Stanford computer scientist, programmed a cluster of 16,000 computers to train itself to automatically recognize images in a library of 14 million pictures of 20,000 different objects. Although the accuracy rate was low – 15.8 percent – the system did 70 percent better than the most advanced previous one.

Deep learning was given a particularly audacious display at a conference last month in Tianjin, China, when Richard F. Rashid, Microsoft's top scientist, gave a lecture in a cavernous auditorium while a computer program recognized his words and simultaneously displayed them in English on a large screen above his head.

Then, in a demonstration that led to stunned applause, he paused after each sentence and the words were translated into Mandarin Chinese characters, accompanied by a simulation of his own voice in that language, which Dr. Rashid has never spoken.

The feat was made possible, in part, by deep-learning techniques that have spurred improvements in the accuracy of speech recognition.

Dr. Rashid, who oversees Microsoft's worldwide research organization, acknowledged that while his company's new speech recognition software made 30 percent fewer errors than previous models, it was "still far from perfect."

"Rather than having one word in four or five incorrect, now the error rate is one word in seven or eight," he wrote on Microsoft's Web site. Still, he added that this was "the most dramatic change in accuracy" since 1979, "and as we add more data to the training we believe that we will get even better results."

One of the most striking aspects of the research led by Dr. Hinton is that it has taken place largely without the patent restrictions and bitter infighting over intellectual property that characterize high-technology fields.

"We decided early on not to make money out of this, but just to sort of spread it to infect everybody," he said. "These companies are terribly pleased with this."

Referring to the rapid deep-learning advances made possible by greater computing power, and especially the rise of graphics processors, he added: "The point about this approach is that it scales beautifully. Basically you just need to keep making it bigger and faster, and it will get better. There's no looking back now."

Our Comment

This latest indication of the amazing autonomy of the human mind that permits it to be freed of the slightest suggestion of anybody's particular ownership. That, however,

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A Family of Capitalist Values

By W. Robert Needham

General definition of system:

A complex of institutions, property rights and motives, values and goals through which a community decides on the composition of the output it produces, [the: *What* goods question]; on the recipes that define the ways outputs are produced [the: *How* question]; and the shares that particular groups claim in that output [the: *For whom* question].

Sweezy's *Differentia Specifica* of capitalism as a class society:

"…under capitalism ownership of the means of production is vested with one set of individuals while work is performed by another…the buying and selling of labour power is the *differentia specifica* of capitalism" (Sweezy, 1942, p. 56).

Macpherson's *Moral corollary*:

"…[capitalism] by its very nature ***compels a continual net transfer*** of part of the power of some men to others, thus diminishing rather than maximizing the equal individual freedom to use and develop one's natural capacities [of those from whom labour power is transferred] which is claimed [for capitalism]" (Macpherson, 1973, pp 10-11).

Bowles and Gintis – *Capitalism as Governance*:

"Capitalism, more than a system of resource allocation and income distribution, *is a system of governance*" (Bowles & Gintis, 1987, p, xi).

Bowles and Gintis seem to echo both Sweezy and Macpherson.

1. Adam Smith on the Labour Theory of Value:

Every man is rich or poor according to the degree in which he can afford to enjoy the necessaries, conveniences, and amusements of human life. But after the division of labour has once thoroughly taken place, it is but a very small part of these with which a man's own labour can supply him. The far greater part of them he must derive from the labour of other people, and he must be rich or poor according to the quantity of that labour he can command, or which he can afford to purchase. *The value of any commodity, therefore, to the person who possesses it, and who means not to use or consume it himself, but to exchange it for other commodities, is equal to the quantity of labour which it enables him to purchase or command. Labour, therefore, is the real measure of the exchangeable value of all commodities. (*Adam Smith in *The Wealth of Nations*, Book 1, Chapter 5.)

2. Karl Marx on the Prices of Commodities:

"The determination of price by cost of production is tantamount to the determination of price by the labor-time requisite to the production of a commodity, for the cost of production consists, first of raw materials and wear and tear of tools, etc., i.e., of industrial products whose production has cost a certain number of work-days, which therefore represent a certain amount of labor-time, and, secondly, of direct labor, which is also measured by its duration." (Karl Marx in *Wage-Labor and Capital*, Chapter 3, By What is the Price of a Commodity Determined?)

"The selling price of the commodities produced by the worker is divided, from the point of view of the capitalist, into three parts:

First, the replacement of the price of the raw materials advanced by him, in addition to the replacement of the wear and tear of the tools, machines, and other instruments of labor likewise advanced by him;

Second, the replacement of the wages advanced; and

Third, the surplus leftover – i.e., the profit of the capitalist.

While the first part merely replaces previously existing values, it is evident that the replacement of the wages and the surplus (the profit of capital) are as a whole taken out of the new value, which is produced by the labor of the worker and added to the raw materials. *And in this sense we can view wages as well as profit, for the purpose of comparing them with each other, as shares in the product of the worker.*" (Italics added.) [$Y = W + \prod$]

And later in that same chapter:

"Finally, in whatsoever proportion the capitalist class, whether of one country or of the entire world-market, distribute the net revenue of production among themselves, the total amount of this net revenue always consists exclusively of the amount by which accumulated labor has been increased from the proceeds of direct labor. This whole amount, therefore, grows in the same proportion in which labor augments capital – i.e., in the same proportion in which profit rises as compared with wages." (Karl Marx in *Wage-Labor and Capital*, Chapter 7, The General Law that Determines the Rise and Fall of Wages and Profits)

3. The Rate of Surplus Value – The Rate of Exploitation, r_e:

4:

$Y = W + \prod$; $W/Y = k$; so $\prod/Y = 1 - k$

$r_e = [Y - W]/W = \prod/W = [\prod/Y]/[W/Y] = (1 - k)/k$

Value, $Y = W + r_e W$

Value, $Y = W (1 + r_e)$

In a two-sector model[1] in which $Y = C + I$ and $Y = W + \prod$, if we know the rate of exploitation and the level of the wage bill then we can calculate the level of profit that the employment of labour will generate. What we refer to as a markup on wage costs will generate a value of product that will cover the wage bill and return a profit. The amount of profit when expressed as a share of value added will be $(1 - k)$.

Take, for example, $r_e = ¾$; this can be read as saying from 7 units of output (3 + 4), 4 is paid to wage labour, as W, and 3 is exploited from labour by the owners of capital, as surplus value, $\prod$. That is: $Y = 4(1.75) = 7$.

Clearly labour management negotiations (over the terms and conditions of employment) is directly connected to these ideas though the rate of exploitation may never be mentioned as such.

5. The Determination of Price in a World of Uncertainty:

$p = AVC (1 + MU)$

We live in a world of uncertainty. Decision makers have to make decisions on the bases of what they think they know, past experience, and best guesses as to the future.

This mark-up expression is a general tool to keep in one's pocket as it were. It is an illustrative device that proxies for a wide variety of cost price formula the use of which has been documented by the work of Fred Lee. "…markup and normal cost pricing procedures have been used since the time of Adam Smith…the historical prevalence of these pricing procedures undermines the need to provide an analytical basis and an ahistorical (theoretical) justification for them…the empirical evidence does not suggest that their usage is a function of the degree of market competition…an *idealized competitive market is a piece of theoretical fiction which post-Keynesians can do without*" (Lee, 1994, p. 311, italics added).

It is up to you to determine the detail in any particular case and with that detail specify the current nature of the cost-price markup procedure used. You will then be expanding or adding to the immense body of statistical evidence compiled by Fred Lee

– the conclusion for which is provided in the above citation.

To explain the general nature of p = AVC (1 + MU); AVC is the measure of average variable costs associated with the level of output, Q, that capitalists have decided to produce. Their decision to produce Q is based on their expectations and knowledge of demand for the product. That knowledge is dependent on what is heard from dealers about how inventories are doing – turning over at normal rates or being drawn down more rapidly than normal or building up to higher levels than expected. Specifically it can be said of those demand findings, that *demand conditions*, determine supply. The costs associated with that supply are then measured, perhaps in part based on quotes from suppliers of needed inputs. The point is that supply costs as represented by AVC are used or may be used, to set a price, p, using a markup, MU%, that is known by historical experience to work fairly well. The price is large enough to cover AVC and AFC and provide a profit per unit of p – AC.

So profit per unit is p – AC and profit in total by TR – TC = $\prod$ = (p – AC)Q

Importantly the prices, so set, are administered to the market – attached to the Q_s when they are finally shipped to dealers (say as suggested retail prices). Dealers may have and apply their own markups. At some point expectations will be realized or not. If realized then expected demand presumably clears the Q at the price p at normal rates of inventory turnover. If inventories turn over at rates that are higher than normal then subsequent adjustments are made, not to price but to Q, and the same markup procedure is applied (perhaps with different cost estimates). If realized demand does not clear Q at expected rates and inventories build up then adjustment to the slower rate of turnover is made by reducing Q.

In effect adjustment to unrealized expectations is made by throwing the adjustment onto the shoulders of labour force. It can be held – as an hypothesis that price adjustments are minimal (that is price competition is avoided).

When labour force adjustments boost Q, employment goes up, and the firm gains by a widening profit per unit. (AC falls because AFC falls. AVC though, is like the costs of a cake recipe, one cake one set of costs, double triple, etc., etc., the number of cakes then the costs go up by the same proportion, that is AVC is constant.) When labour force adjustments reduce Q, employment falls (unemployment goes up; shifts are laid-off; plants may be shut down) and the firm tries to recoup the costs already buried in past levels of output. It is open for test (research) whether this means prices will be reduced, or whether they will be increased or remain constant. The only thing one can be sure of is that contracted costs are either already paid or remain to be paid. A possible scenario is that the flow of income is so reduced that bankruptcy is the only answer.

One of the implications of this analysis is that the strong have an incentive to drive out the weak. Driving out the weak means that market shares for the survivors increase and along with that they have increased security and stability. Driving out the weak is equivalent to competition being destroyed and replaced by greater degrees of monopoly control.

6. The System and Price and Income Distribution:

$p_jQ_{oj} = wN_{oj} + \sum p_iq_{ij} + r\%[\sum p_iq_{ij}]$; i,j = 1, 2 …n where;

p_jQ_{oj} represents the value of output of the jth industry;

wN_{oj} represents the labour costs in the jth industry;

$\sum p_iq_{ij}$ represents commodity input costs in the jth industry; and

$r\%[\sum p_iq_{ij}]$ represents the profit to be earned on the value of the stock of capital (here seen as the produced commodity inputs used, and they are used up each period and reproduced each period).

r% is the markup and/or profit rate.

or $p_jQ_{oj} = wN_{oj} + \sum p_iq_{ij}$ (1 + r%}

or $p_j = wN_{oj}/Q_{oj} + \sum p_iq_{ij}/Q_{oj}$ (1 + r%} this is the previous statement divided through by Q_{oj}

or $p_j = wn_{oj} + \sum p_ia_{ij}$ (1 + r%}; where n_{oj} is labour requirements per unit of output and a_{ij} represents commodity input requirements from the i^{th} industry per unit of output of the j^{th} industry. This simply defines $n_{oj} = N_{oj}/Q_{oj}$; and $a_{ij} = q_{ij}/Q_{oj}$

A sector j represents a producing industry in an economy that uses produced commodity inputs along with labour to produce various outputs. Some of the outputs are only of, and, for use as, produced commodity inputs – these are conventionally thought of as *intermediate demands;* some of the outputs are only for *final demands*, like Consumption, or C in the standard two-sector model of a capitalist economy. Conceptually the economy rolls through time each period reproducing the Qs by using in each period the quantities of produced commodity inputs and the labour time required – as given by engineering recipes.

There are as many unknowns as there are prices. That is if we take the wage rate as given along with the rate of profit the j unknown prices may be solved. It will be found that if wages double triple or quadruple for any given rate of profit then prices will go up by the same proportion. If wages are taken as given and rates of profit are increased then prices also rise. So the rate of profit is the determinant of inflation and the standard of living of workers and indeed of all people on fixed money incomes. The following simple example makes this clear.

7. An Illustration of the Interdependence of Prices and Income Distribution in a 3-Sector Economy: The Money Measurement of Domestic Product and Expenditure with Distributive Shares, W/Y = k, and $\prod$/Y = (1 – k) in Domestic Product, Y.

The aim is constructing an input-output table in money or dollar terms using known recipes showing the real amounts of inputs used to produce outputs. The money values or unit prices, p, attached to outputs and produced-commodity inputs have to be determined. The money wage rate or rates, w, attached to labour used must be known (by collective bargaining say).

The Real Data on Outputs and Inputs

Suppose a 3–Sector (or 3–Industry) Economy: S_1, S_2, S_3.

Their Producing activities are placed in three columns labeled. S_{0j} (j = 1, 2, 3)

Their sales activities are placed in three consistently intersecting rows. S_i (i = 1, 2, 3)

The sectors produce the following outputs: Q_{01} = 100 units; Q_{02} = 100 units; Q_{03} = 500 units.

Employment levels in the three sectors are: N_{01} = 10 workers; N_{02} = 50 workers; N_{03} = 100 workers

Sector 1 sells 25% of its output to Sector 2 and 75% of its output to Sector 3. These sales by Sector 1 constitute what can be called *intermediate demands* by the purchasing sectors (2 and 3) of the produced commodity inputs they require to make their respective recipes.

Sector 2 sells 50% of its output to Sector 1 and 50% of its output to Sector 3. These sales by Sector 2 are also *intermediate demands* by the purchasing sectors (1 and 3) of needed produced commodity inputs.

Sector 3 produces a commodity that can only be eaten. In other words no part of the output of the third industry is sold as an input to any industry. We may consider Sector 3 output as available for consump-

tion by workers and capitalists. In Keynesian terms this is a *final demand* commodity and in this model it is the only final demand commodity.

So do note the distinction between final products and final demands and produced commodity inputs and intermediate sales and purchases.

The real data on outputs and inputs are entered in the appropriate cells in Table 1A. Note that the rows "add up" (except for the last row, Q_{oj}), and also note we can't add the items in each column.

To add the columns and the last row we need money prices. In short, we can't add apples and oranges without prices. And we can't add labour costs to commodity input costs without prices and wage rates.

For the respective producing sectors, S_{0j} (j = 1, 2, 3) and for the economy in total, $\sum S_{oj}$, we have to determine the values of outputs produced, p_jQ_{oj} (j = 1, 2, 3) and $\sum p_jQ_{oj}$, the associated wage bills, W_{0j}, and $\sum W_{0j}$, and costs of produced commodity inputs $\sum p_iq_{ij}$ and levels of profit $\prod_{0j}$ and $\sum\prod_{0j}$. In summary we need to know Table 1B.

Table 2 shows the correct money values, using one possible set of prices associated with these outputs. The price set is: p_1 = \$4.42, p_2 = \$6.22, p_3 = \$3.41. The calculations, outlined below are based on a wage rate, w = \$10.00 and a rate of profit or markup of 10%.

Measures of Domestic Product:

• The Expenditure [or Y = C + I] Approach: Final demands = 1,705

• The Factor Income [or Y = W + $\prod$] Approach: Factor earnings = W + $\prod$ = 1,705

• Avoidance of double counting approach:

$\sum p_jQ_{oj}$ = \$2,769.00 (this may be referred to as the duplicated value of output)

$\sum p_jQ_{oj} - \sum\sum p_iq_{ij}$ = 2,769.00 – 1,064.00 = 1,705 = W + $\prod$

Measures of Structural Parameters:

k = W/Y = 1600/1705 = .9384; (1 – k) = $\prod$/Y = 1 – .9384 = .0616; or 105/1705 = .0616; the rate of exploitation: r_e = .0616/.9384 = .06564; the rate of profit: r% = 105/1064 = 10% (rounded). And as a check the value of output is Y = W (1+ 0.06564) = 1705; and $\prod$ = 105

Note that the wage rate and the wage bill just sit there as givens. But if wage rate went up it would have an effect on prices and the values of outputs and inputs

Note the apparent relation between the value of the stock of capital and the rate of profit specifically.

The value of the stock of capital and the rate of profit depends on the prices that are set. In other words the higher the prices the higher the value of the stock of capital, the higher the profit rate and the profit share and correspondingly the lower the wage share in domestic income.

This sounds intuitively correct. But, it is clearly important to know how prices are set. Here the idea is that they are set using some markup applied to some measure of the costs of production. Again, this is consistent with Fred Lee's massive work in which he said.

"…markup and normal cost pricing procedures have been used since the time of Adam Smith…*the historical prevalence of these pricing procedures undermines the need to provide an analytical basis and an ahistorical (theoretical) justification for them*…the empirical evidence does not suggest that their usage is a function of the degree of market competition…an 'idealized competitive market is a piece of theoretical fiction which post-Keynesians can do without" (Lee, 1994, p. 311).

Table 3 provides the results obtained by using four alternative rates of profit (markup rates on costs of produced commodity inputs used (the stock of capital used) in production, for the 3-sector economy.

The markup is taken as r%, and there are 4 possible rates – successively: 0, 10%, 50% and 75%. It is assumed that there is a reasonably competitive economy so that the rate for the particular case applies over all sectors. (You can reflect on or imagine perhaps greater realism by assuming differential degrees of monopoly power and different markup rates. But this does not weaken and if anything strengthens the ideas of power in and over the distribution of income.)[2] Now using the selected r% as a markup simply apply the rate of profit to the value of the produced commodity inputs used by each sector. This will provide in each case a set of price equations.

(1) $Q_1.p_1 = w.N_{01} + p_2.q_{21} + r\%(p_2.q_{21})$

(2) $Q_2.p_2 = w.N_{02} + p_1.q_{12} + r\%(p_1.q_{12})$

(3) $Q_3.p_3 = w.N_{03} + (p_1.q_{13} + p_2.q_{23}) + r\%(p_1.q_{13} + p_2.q_{23})$

Or the equations may also be written as:

(1a) $Q_1.p_1 = w.N_{01} + (1 + r\%)\ (p_2.q_{21})$

(2a) $Q_2.p_2 = w.N_{02} + (1 + r\%)(p_1.q_{12})$

(3a) $Q_3.p_3 = w.N_{03} + (1 + r\%)(p_1.q_{13} + p_2.q_{23})$

Table 1A: The Physical Inputs and Outputs (The Real Data)

	S_{01}	S_{02}	S_{03}	Q_i
S_1		q_{12} = 25	q_{13} = 75	Q_1 = 100
S_2	q_{21} = 50		q_{23} = 50	Q_2 = 100
S_3				Q_3 = 500
N_{oj}	N_{01} = 10	N_{02} = 50	N_{03} = 100	$\sum N$ = 160
Q_{oj}	Q_{01} = 100	Q_{02} = 100	Q_{03} = 500	

Table 1B

S–1:	p_1Q_{01} =	; W_{01} =	; $\sum p_iq_{ij\ (j=1)}$ =	; $\prod_{01}$ = .
S–2	p_2Q_{02} =	; W_{02} =	; $\sum p_iq_{ij\ (j=2)}$ =	; $\prod_{02}$ = .
S–3	p_3Q_{03} =	; W_{03} =	; $\sum p_iq_{ij\ (j=3)}$ =	; $\prod_{03}$ = .
$\sum S$	$\sum p_jQ_{0j}$	; $\sum W_{0j}$ =	; $\sum\sum p_iq_{ij}$ =	; $\sum\prod_{0j}$ =

Table 2: Input-Output Table Using Money Prices and Wages

	S_{01}	S_{02}	S_{03}	Q_i
S_1		p_1q_{12} = 110.5	p_1q_{13} = 331.5	p_1Q_1 = 442
S_2	p_2q_{21} = 311		p_2q_{23} = 311	p_2Q_2 = 622
S_3				p_3Q_3 = 1,705
$w.N_{oj} = W_{oj}$	W_{o1} = 100	W_{o2} = 500	W_{os} = 1000	$\sum W$ = 1,600
$\prod_{0j}$	$\prod_{01}$ = 31.00	$\prod_{02}$ = 11.50	$\prod_{03}$ = 62.50	$\sum\prod$ = 105
$p_j\ Q_{oj}$	p_1Q_{01} = 442	p_2Q_{02} = 622	p_3Q_{03} = 1,705	$\sum_{oj}$= 2,769

Table 3: Summary Statistics for the Three-Industry Economy (w = W/N = \$10 and r% = 0%, 10%, 50%, 75%)

Case r%	p_1	p_2	p_3	W/Y = k	\$K	\$K/\$Y	$\prod$/K	$\prod$/Y = (1 – k)
0	4.00	6.00	3.20	1.00	1,000	0.63	0%	0.00
10	4.42	6.22	3.41	0.94	1,064	0.62	10%	0.06
50	6.61	7.48	4.61	0.69	1,409	0.61	50%	0.31
75	8.71	8.81	5.83	0.55	1,752	0.60	75%	0.45

Tabel 4: An Example of How to Solve the Price Equations, for p_1, p_2, and p_3, when the Rate of Profit is r = 10% and the wage rate is w = $10.00

(1)	$100p_1 = 10w + 1.1(50p_2)$
(2)	$100p_2 = 50w + 1.1(25p_1)$
(3)	$500p_3 = 100w + 1.1[75p_1 + 50p_2]$
or (1*)	$100p_1 = 10w + 55p_2)$
also (2*)	$100p_2 = 50w + 27.5p_1$
(1**) take (1*); and divide by 100. i.e., (1*) ÷ 100	$p_1 = 0.1w + 0.55p_2$
Take this result and substitute in (2*)	$100p_2 = 50w + 27.5[0.1w + 0.55p_2]$
	$100p_2 – 15.125\ p_2 = 50w + 27.5[0.1w]$
	$84.875p_2 = 50w + 2.75w$
	$84.875p_2 = 50w + 2.75w$
	$p_2 = [52.75w]/84.875$
(2**)	$p_2 = 0.6215w$
Since w = $10.00	**$p_2 = 6.22$ (rounded)**
If w = $20.00	$p_2 = 12.44$
If w = $30.00	$p_2 = 18.66$
Substitute $p_2 = 6.22$ in (1*)	$p_1 = .1w + .55(6.22)$
	$p_1 = .1w + 3.42$
Since w = $10.00	**$p_1 = 1 + 3.42 = 4.42$**
If w = $20.00	$p_1 = 8.84 = .1w + .55(12.44) = 2 + 6.84$
If w = $30.00	$p_1 = 13.26 = .1w + .55(18.66) = 3 + 10.26$
Substitute $p_1 = 4.42$ and $p_2 = 6.22$ in (3)	$500p_3 = 100w + 1.1[75(4.42) + 50(6.22]$
	$500p_3 = 100w + 1.1[642.5]$
	$500p_3 = 100w + 706.75$
Since w = $10.00	**$p_3 = 1,706.75 / 500 = 3.41$**
If w = $20.00	$500p_3 = 2000 + 1.1[75(8.84) + 50(12.44]$
	$p_3 = 6.82 = [2000 + 1.1(663 + 622)] / 500$
If w = $30.00	$500p_3 = 3000 + 1.1[75(8.84) + 50(12.44]$
	$500p_3 = 3000 + 1.1[75(13.26) + 50(18.66]$
	$p_3 = 10.23 = [3000 + 1.1[994.5 + 933.] / 500$

Table 5

r% = 0%	$r_e = 0$	Y = 1600(1.0) = 1600
r% = 10%	$r_e = .0638$ that is .065/.94	Y = 1600(1.0638) = 1704
r% = 50%	$r_e = .437$ that is .31/.69	Y = 1600(1.437) = 2299
r% = 75%	$r_e = .822$ that is .45/.55	Y = 1600(1.822) = 2915

Table 6: The Real Wages of Labour

Profit Rate— r	0%	10%	50%	75%
Price of Q_3— p_3	$3.20	$3.41	$4.61	$5.83
NDP = Y = p_3Q_3	$1,600	$1,705	$2,300	$2,915
Wage Bill— W	$1,600	$1,600	$1,600	$1,600
Profit— $\prod$	0.00	$105.00	$700	$1,315
r_e	0	.069	.437	.822
Real Wage Income = W/p_3	500	469.2	347.07	274.4
Real Wage Rate = $w/p_3 = 10.00/p_3$	3.12	2.93	2.17	1.72
Check: Real Wage Income = w/p_3 x N	3.12 x 160 = 499.2	2.93 x 160 = 468.8	2.17 x 160 = 347.2	1.72 x 160 = 275.2

Now as an example write the equations using what is known and assuming a rate of profit of 10%.

(1a*) $100.p_1 = 100 + (1 + 0.1)\ (p_2.50)$

(2a*) $100.p_2 = 500 + (1 + 0.1)(p_1.25)$

(3a*) $500.p_3 = 1000 + (1 + 0.1)(p_1.75 + p_2.50)$

See Table 4.

Interpretation of the Real World

Power (the root of governing dynamics) is centered in capitalists' animal spirits, control of output decision and markups on costs. The example meets the definitions of capitalism provided by Sweezy, Macpherson and Bowles and Gintis. *The profit rate a controlled and therefore controlling parameter?*

In an accounting sense we normally think that profit falls out as a residual. But this exercise suggests that it is the wage-share that, in a social control sense what falls out as a residual. That is workers get, as a share in net output, what ever is left after capitalists take what they want from the system. John Kenneth Galbraith said once, (I don't remember where), that the job of the management side during wage negotiations was to find out what labour wanted and to give it to them – because, as this exercise suggests, management can always get back whatever they gave to labour, and generally whatever they want from the system, just by raising prices.

What about the rate of exploitation? r_e, generally is:

$r_e = (Y – W)/W = \prod / W = (\prod / Y) / (W / Y) = (1 – k)/ k$

Calculate the r_e in each of the 4 cases[3] (see Table 5).

The Real Wages of Labour

The exercise is summarized in Table 6 above along with the measure of real wage income and the real wage rate.

In this economy, employed labour of 160 workers is paid a total wage bill of $1,600. How far this money income "goes," or how much it will buy, depends on the prices that labour has to pay. In this simple exercise the price labour has to pay is p_3, the price of the 3rd commodity. It has been shown that this price depends on the rate of profit. Four test cases on the rate of profit have been run.

The conclusion that emerges from this is that although workers do exactly the same amount of work under all profit rate regimes the real wage varies with the profit rate. (note there are no marginal products in this exercise.) In other words though there is no variation in real product produced per

worker employed, the real wage rate and the level of real wage income falls with increases in the rate of profit.[4] (This is also what happens to all fixed income recipients – pensioners for example – when the prices of the commodities they must buy go up.)

As a corollary profits are seen as emerging not because of work done by capitalists but by the power and control they exercise over the system because of their ownership of the means of existence. In effect it seems to imply that *what capitalists contribute is to allow industry to be owned by them selves*. In a sense Keynes seemed to get it right when he said:

"Capitalism is the astonishing belief that the most wickedest of men will do the most wickedest of things for the greatest good of everyone." Keynes, quoted in: Khalid, Haythum Raaft, *Book of Famous Quotes*.

Similarly Keynes in *The End of Laissez-Faire* said:

"…The world is not so governed from above that private and social interest always coincide. It is not so managed here below that in practice they coincide. *It is not a correct deduction from the Principles of Economics that enlightened self-interest always operates in the public interest. Nor is it true that self-interest is generally enlightened; more often individuals acting separately to promote their own ends are too ignorant or too weak to attain even these. Experience does not show that individuals, when they make up a social unit,* [i.e., act collectively] *are always less clear sighted* [they are clear sighted] *than when they act separately*" (Keynes, 1927, pp. 39-40).

Note that J.M. Keynes is here rejecting Adam Smith as did John Nash.

In keeping with the capitalism, democracy and the free trade theme, Keynes also said:

"Capitalism is not a success. It is not intelligent, it is not beautiful, it is not just, it is not virtuous, – and it does not deliver the goods. In short we dislike it, and we are beginning to despise it. But when we wonder what to put in its place we are extremely perplexed…. We each have our own fancy. Not believing that we are saved already, we should like to have a try at working out our own salvation. We do not wish, therefore, to be at the mercy of world forces working out or trying to work out some uniform equilibrium according to ideal principles, if they can be called such, of laissez-faire capitalism…. We wish – for the time at least…to be our own masters, and to be as free as we can make ourselves from the interferences of the outside world…. It is my central contention that…we all need to be as free as possible of interference from economic changes elsewhere, in order *to make our own favorite experiments toward the ideal social republic of the future…. We shall discover it as we move along, and we shall have to mold our material in accordance with our experience*" (Keynes, 1932–33, pp. 761-762, 763-768).[5]

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And what of Adam Smith? Smith was not one to abstract from reality. While constructing a theoretical model of *natural liberty* he was also an acute observer of the role and relationships amongst men in the real world. Thus of the capitalist class he observed:

"*…[profit] is naturally low in rich, and high in poor countries, and it is always highest in the countries which are going fastest to ruin.* The interest of this third order, [the capitalist class] has not the same connexion with the general interest of society as that of the other two [workers and landlords]…. As their thoughts…are commonly exercised rather about the interest of their own particular branch of business, than about that of the society, their judgment, even when given with the greatest candour (which it has not been upon every occasion), is much more to be depended upon with regard to the former of those two objects, than with regard to the latter….

"The proposal of any new law or regulation of commerce which comes from this order, ought always to be listened to with great precaution, and ought never to be adopted till after having been long and carefully examined, not only with the most scrupulous, but with the most suspicious attention. It comes from an order of men, whose interest is never exactly the same with that of the public, who have generally an interest to deceive and even to oppress the public, and who accordingly have, upon many occasions, both deceived and oppressed it." [While, of the workers, Smith argued that] "…though the interest of the labourer is strictly connected with that of society, he is incapable of comprehending that interest, or of understanding its connexion with his own…. In the public deliberations, therefore, his voice is little heard and less regarded, except upon some particular occasions, when his clamour is animated, set on, and supported by his employers, not for his, but for their own particular purposes" (Smith, 1937, p. 250).

Also on an evaluative theme concerned with the sometimes mistaken equation of capitalism and democracy, noted Canadian David Suzuki said:

"You end up by mistake with this definition of democracy*: capitalism leads to middle class, which leads to democracy*. And that idea is not only common, it absolutely dominates throughout the West today…. And it's just garbage. It doesn't stand up to a historical analysis in any way, shape or form…the extent to which individualism, real individualism, and the concepts of responsibility, the public good and democracy didn't come out of the Industrial Revolution and the formation of the middle class. They, in fact, came out of a very long process that you can take back to Athens" (Suzuki & Dressel, 1999).

The Implications for Continuous Inflation

These calculations say that if the rate of profit remains at 10%, then doubling, tripling and quadrupling the wage rate results in a doubling, tripling and quadrupling in the prices of each of the commodities produced.

It is clear that inflation results from raising profit rates and it arises from increasing wage rates. In the real world we know that wages and prices seem to chase each other. It can be expected that labour will want to redress declines in standards of living occasioned by increasing prices.

The people who are most hurt in the ensuing cat and mouse game are fixed income earners.

But if the system simply roles through time producing the same bundle of real commodities and services one can ask why allow wages to chase up prices or prices to pull up demands for higher wages by labour?

One can go further and imagine the system as we now have it as comprised of a basement or base structure in which the real commodities and services are produced. In this ground-zero area or level are found the engineers and workers who know how to design and make the things that are important to sustain life.

Superimposed on top of the basement

are pyramid-like layers of superstructure. At one level of the superstructure are the accountants and financial officers who control the offices of price administration. On top of this are included the people who are more clearly nothing but financial manipulators. They speculate in currencies and prices of stocks and bonds and contribute nothing to real output and standards of living but *financial gimmickry*.

Any number of people have described this situation. The financial manipulators can make vast fortunes – and sometimes they bring ruin to even the largest institutions, (Barclay's Bank as one example; Enron as another.) Overall their highly inflated incomes allow them to lay claim to the real products that ordinary people need and increasingly find difficult to obtain.

The 1988 indictment of government support (McQuaig, 1988) for the corporate sector by Kierans and Stewart echoes that of Adam Smith from 1776. The question of system morality is emphasized.

"There is a certain irony, to students of economic history, in the argument that the "science" of economics requires its practitioners to bring cold, hard logic to bear, foreswearing all moral and political judgment. If a thing is economic, it is worth doing; if it is uneconomic, it is not. No other considerations need apply." …when the facts suggest, however, that…." We embrace a corporate system that bankrupts the ethical and responsible, and rewards greed and exploitation…they behave as we would expect them to, without compunction, compassion or morality; that is the nature of the institution…. *This is a new and different and dangerous corporate world, in which virtue is punished and greed rewarded, in which hard work, clever ideas and consistent quality count for less than financial gimmickry, in which the main purpose in taking over another corporation is not to make it work better, but to loot it"* (Kierans & Stewart, 1988, pp. 11, 12, 134, 135, emphasis added).

Michael Walzer summarizes the basic issue in governance that is relevant to the concern for the contradiction between capitalism and democracy:

"…corporations are – this is now a commonplace of American political science – private governments; their transactions are significantly political in character, taking the form of command and obedience rather than free exchange; their owners and agents make decisions that determine the costs and risks that other people must live with. It is the experience of private governments that prompts the internal opposition of unions and the external interventions of the state. The unions represent men and women directly subject to corporate power; the state represents men and women radically affected by corporate decisions. But these two forms of representation are only sometimes effective, and effective then only to a limited degree, *because corporate power at its core remains exempt from the rules of democracy*…justice requires…we… explore systematically the alternatives to private government: public ownership and workers control and combinations of the two" (Walzer, 1986, pp. 146-147, emphasis added, and Galbraith, 2004).

A Note on Background to the Three Sector Model Outlined Above

The three-sector model seems rather straightforward. Hidden behind it, however, are significant debates that are anything but straightforward. The debates took place in the 1950s through 70s, and pitted economists at Cambridge University (England), particularly Joan Robinson, against MIT economists in Cambridge Massachusetts, particularly Robert Solow and Paul A. Samuelson.[6]

The debates had to do with the theory of capital, the measurement of an aggregate stock of capital and the dependence of the values of the stock of capital on the rate of profit and the distribution of income. Perhaps too simply, to know the value of the stock of capital you must define it and know the rate of profit; but to know the rate of profit you must know the value of the stock of capital. The three-sector model deliberately took the stock of capital to be the produced commodity inputs used in production. They were valued or priced with an assumed rate of profit, or markup, and the assumed wage rate. Economic power, or governance, was central to that.

It seems generally recognized that Cambridge England won the debates. Nevertheless a truce was called which allowed both sides to get on with their other work. Part of the weariness that led to the truce is that Joan Robinson ran up against a stonewall of religious belief. C.E. Ferguson, for example, specifically confessed his faith or belief in neoclassical theory. The truce has meant, in effect, that neo-classicals act as if nothing has happened and say nothing at all. This seems to implicitly amount to belief in marginal productivity theory. (There were no marginal products in the Three-sector model.)

At the same time it must be humiliating for neoclassical economists s to have to merely admit a religious belief in one's own fabrications.

So when faced with belief no matter the strength of the opposing arguments of Joan Robinson. Joan must have simply shrugged when she said let Samuleson "rot in peace."

"I feel frustrated by our round of papers because no-one answers me either yes or no. The argument started with my attacking… a fatal flaw in neoclassical methodology…. After several vain attempts to ring though, I shall in future leave Samuelson to rot in peace…."[7]

Again one can recall the notion that silence implies agreement.

"Silence procedure (French: procédure d'approbation tacite; Latin: qui tacet consentire videtur, 'he who is silent is taken to agree,' 'silence implies/means consent') is a way of formally adopting texts, often, but not exclusively in international political context. A draft version of the text is circulated among participants who have a last opportunity to propose changes or amendments to the text. If no amendments are proposed (if no one 'breaks the silence') before the deadline of the procedure, the text is considered adopted by all participants. Often this procedure is the last step in adopting the text, after the basic premises of the text have been agreed upon in previous negotiations. 'Breaking the silence' is only a last resort in case a participant still has fundamental problems with parts of the text and is therefore the exception rather than the rule" (Wikipedia).

As I read the record it seems Joan Robinson towards the end of her life in 1983, had moved or was moving to where Barbara Wootton was in 1938 in writing *Lament for Economics*.[8] In 1938 Barbara Wootton simply shrugged, turned her back and walked away from economics to Sociology and *praxis* attempts to improve the standard of living of society (Oakley, 2011). Noting her dislike for the terms *economics* and *economic science* she suggested a return to political economy.[9]

I think Joan Robinson at the end was of the view that they, at Cambridge, had taken a wrong turn early on and should have pursued political economy and moral philosophy. Thus she was in effect picking up on Barbara Wootton from 1938. In advocating moral philosophy as a starting point Joan Robinson agreed with Kenneth Arrow that "the invisible institution of the moral law" was necessary to society."[10]

Endnotes

1. In the simplest model the state of technique is taken as Y/N = 1 in all sectors. This simply means that 1 worker and a machine will produce a unit of output.

2. Note too, that the rates of profit and derived prices could conceptually apply to both a capitalist economy and a worker owned economy in which it had *been democratically decided* to generate a surplus in excess of the wage bill.

3. Apologies for rounding errors.

4. This observation seems to cast doubt on the marginal productivity theory (MPT) of income distribution. This theory holds that workers are paid their marginal product and in that sense are paid just what they produce and therefore they get what they deserve from the system. This theory has the effect of allowing the question of justice in the system to be ignored.

5. It can be noted in passing that, if "we are saved already," the view of Dietrich Bonhoeffer, that "God is teaching us that we must live as men who can get along very well without him" (quoted by Robinson, J.A.T., Bishop of Woolwich (1983) in *Honest to God* (p. 39), London: SCM Press).

From a socialist point of view the implication is that Christian values are to be expressed in the conduct of everyday life. In this, the normal secular principles of liberty, equality and fraternity or community mindfulness, provide their own "trinity" of social values. Clearly it seems Keynes wants a return to a political economy approach (which he never left) and away from mainstream neoclassical economics. See also Wootton, 1938.

6. The debate is outlined in blow-by-blow detail in Turner, 1989. See also Aslanbeigui & Oakes, 2009.

7. Turner, 1989, p. 161, citing JR, 1981d: 128-129. Debate 1970s, *What are the Questions?* 123-130.

8. Note that subsequent authors in the anti-neo-classical tradition (including Galbraith and Myrdal) have not improved much, if at all, on what Barbara Wootton did in 1938 in *Lament for Economics*. Steve Keen (2011) seems an exception. See also www.youtube.com/watch?v=CehLP2iNzMA.

9. Wootton should be given posthumous honorary membership in the World Economic Association. This organization boasts a membership near 10,000 of people who have walked away from neoclassical economics.

10. Turner, 1989, p. 161, citing JR, CEP 5:43-47.

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Learning Curve *from page 2*

leaves an unanswered question that begs an answer. Once you have granted complete autonomy to non-human versions who are enabled to act on their own without need of actual humans being involved, what do the released humans do for a living? In short, you must address the problem of bringing in the masses of humans who currently must work for their livelihood if they and their families are to survive. Failing that, hunger to the point of starvation will take over.

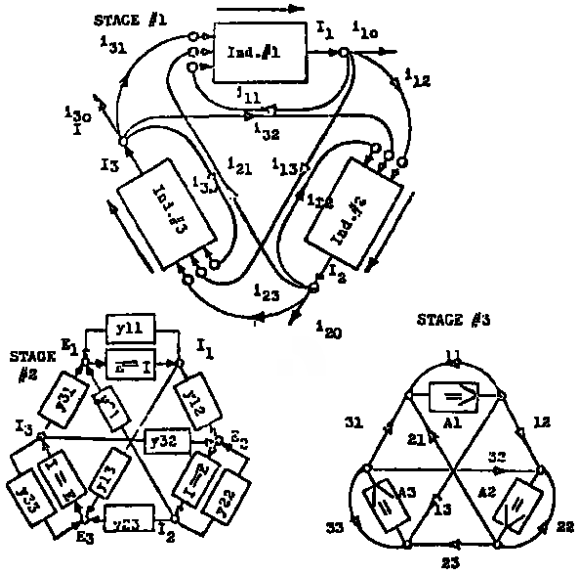
Humans and their technology must be brought into a relationship of kinship. For in the absence of such a recognized relationship, an effortless, dehumanized public sector will spell the final curse of technology that will destroy humanity's ultimate chance of earning a living.

The tricks and subtleties of the human mind can be isolated and initiated to the point where no actual human need be involved. That leaves uncovered the hazards of the resulting survival problems for human-like efforts that no longer need actual humans to succeed. *W.K.*

Silent Weapons for Quiet Wars: Part 2

The following is the final part of an article that was provided to COMER in a PDF and is printed as received. Note that some of the figures are incomplete. Part 1 appeared in the October issue.

Figure 9: Stages of Schematic Simplification



Generalization

All of this may now be summarized. Let I_j represent the output of industry j, and

- i_{jk}, the amount of the product of industry j absorbed annually by industry k, and
- i_{jo}, the amount of the same product j made available for 'outside' use. Then, see Figure 10.

Substituting the technical coefficiences, y_{jk} see Figure 11, which is the general equation of every admittance in the industry circuit.

Final Bill of Goods. Figure 12 is called the final bill of goods or the bill of final demand, and is zero when the system can be closed by the evaluation of the technical coefficients of the "non-productive" industries, government and households. Households may be regarded as a productive industry with labor as its output product.

The Technical Coefficients. The quantities y_{jk} are called the technical coefficients of the industrial system. They are admittances and can consist of any combination of three passive parameters, conductance, capacitance, and inductance. Diodes are used to make the flow unidirectional and point against the flow.

- g_{jk} = economic conductance, absorption coefficient
- y_{jk} = economic capacitance, capital coefficient
- L_{jk} = economic inductance, human activity coefficient

Types of Admittances. See Figures 13 and 14.

Figure 10

$$I_j = i_{j1} + i_{j2} + i_{j3} + \cdots + i$$

$$= \sum_{k=1}^{k=m} i_{jk} + i_{jo}$$

Figure 11

$$i_{jk} = y_{jk} I_k$$

$$I_j = \sum_{k=1}^{k=m} i_{jk} + i_{jo} = \sum$$

Leontief Matrix for $j = 1,2,3,\ldots,m$ $\left\{ I_j - \sum_{k=1}^{k=m} y_{jk} I \right.$

Let I_k at the output of in
sented by a demand voltage E_k a
input, i.e., let $E_k = I_k$. Then

$$i_{jk} = y_{jk} E_k$$

The Household Industry

The industries of finance (banking), manufacturing, and government, real counterparts of the pure industries of capital, goods, and services, are easily defined because they are generally logically structured. Because of this their processes can be described mathematically and their technical coefficients can be easily deduced. This, however, is not the case with the service industry known as the household industry.

Household Models

When the industry flow diagram is represented by a 2-block system of households on the right and all other industries on the left, the results in Figure 15.

The arrows from left to right labeled A, B, C, etc., denote flow of economic value from the industries in the left hand block to the industry in the right hand block called 'households.' These may be thought of as the monthly consumer flows of the following commodities. A – alcoholic beverages, B – beef, C – coffee, …, U – unknown, etc.…

The problem which a theoretical economist faces is that the consumer preferences of any household is not easily predictable and the technical coefficients of any one household tend to be a nonlinear, very complex, and variable function of income, prices, etc.

Computer information derived from the use of the universal product code in conjunction with credit-card purchase as an individual household identifier could change this state of affairs, but the UPC method is not yet available on a national or even a significant regional scale. To compensate for this data deficiency, an alternate indirect approach of analysis has been adopted known as economic shock testing. This method, widely used in the aircraft manufacturing industry, develops an aggregate statistical sort of data.

Applied to economics, this means that all of the households in one region or in the whole nation are studied as a group or class rather than individually, and the mass behavior rather than the individual behavior is used to discover useful estimates of the technical coefficients governing the economic structure of the hypothetical single-household industry.

Notice in the industry flow diagram that the values for the flows A, B, C, etc., are accessible to measurement in terms of selling prices and total sales of commodities.

One method of evaluating the technical coefficients of the household industry depends upon shocking the prices of a commodity and noting the changes in the sales of all of the commodities.

Economic Shock Testing

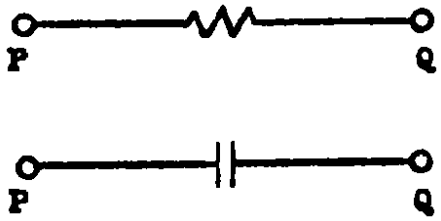
In recent times, the application of *Operations Research* to the study of the public economy has been obvious for anyone who understands the principles of shock testing.

In the shock testing of an aircraft airframe, the recoil impulse of firing a gun mounted on that airframe causes shock

Figure 12

$$\sum_{j=1}^{j=m} i_{jo} = i_{1o} + i_{2o} + i_{3o} + \cdots + i_{mo}$$ is called

Figure 13



waves in that structure which tell aviation engineers the conditions under which some parts of the airplane or the whole airplane or its wings will start to vibrate or flutter like a guitar string, a flute reed, or a tuning fork, and disintegrate or fall apart in flight.

Economic engineers achieve the same result in studying the behavior of the economy and the consumer public by carefully selecting a staple commodity such as beef, coffee, gasoline, or sugar, and then causing a sudden change or shock in its price or availability, thus kicking everybody's budget and buying habits out of shape.

They then observe the shock waves which result by monitoring the changes in advertising, prices, and sales of that and other commodities.

The objective of such studies is to acquire the know-how to set the public economy into a predictable state of motion or change, even a controlled self-destructive state of motion which will convince the public that certain "expert" people should take control of the money system and reestablish security (rather than liberty and justice) for all. When the subject citizens are rendered unable to control their financial affairs, they, of course, become totally enslaved, a source of cheap labor.

Not only the prices of commodities, but also the availability of labor can be used as the means of shock testing. Labor strikes deliver excellent tests shocks to an economy, especially in the critical service areas of trucking (transportation), communication, public utilities (energy, water, garbage collection), etc.

By shock testing, it is found that there is a direct relationship between the availability of money flowing in an economy and the real psychological outlook and response of masses of people dependent upon that availability.

For example, there is a measurable quantitative relationship between the price of gasoline and the probability that a person would experience a headache, feel a need to watch a violent movie, smoke a cigarette, or go to a tavern for a mug of beer.

It is most interesting that, by observing and measuring the economic models by which the public tries to run from their problems and escape from reality, and by applying the mathematical theory of *Operations Research*, it is possible to program computers to predict the most probable combination

Figure 14

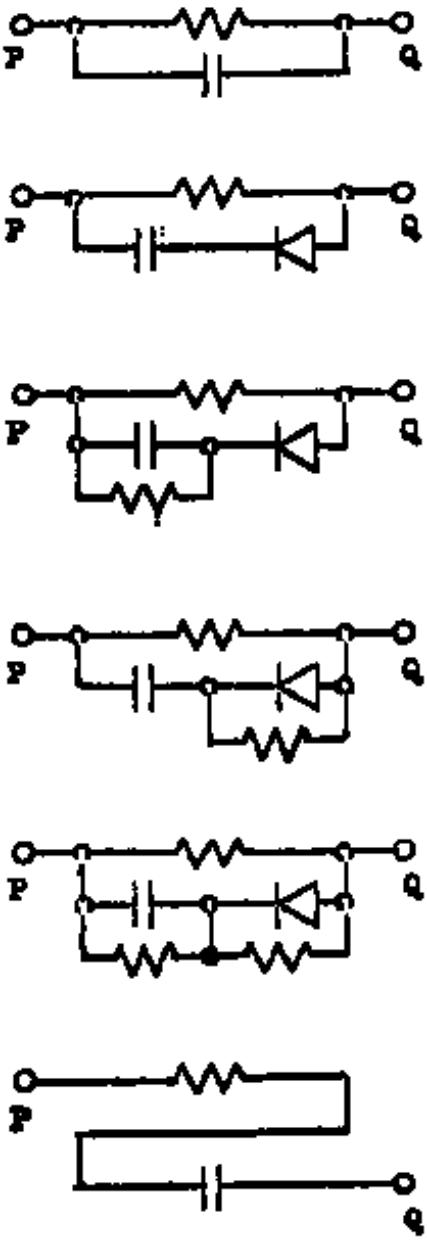
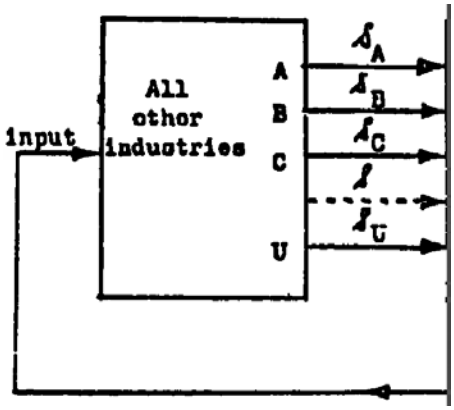


Figure 15



of created events (shocks) which will bring about a complete control and subjugation of the public through a subversion of the economy (by shaking the plum tree).

Introduction to the Theory of Economic Shock Testing

Let the prices and total sales of commodities be given and symbolized as follows:

Let us assume a simple economic model in which the total number of important (staple) commodities are represented as beef, gasoline, and an aggregate of all other staple commodities which we will call the hypothetical miscellaneous staple commodity "M" (e.g., M is an aggregate of C, S, T, U, etc.). See Figure 16.

Example of Shock Testing

Assume that the total sales, P, of petroleum products can be described by the linear function of the quantities B, G, and M, which are functions of the prices of those respective commodities.

$P = a_{PG}\,B + a_{PG}\,G + a_{PM}\,M$

Figure 16

Commodities	Price Function	Total Sales
alcoholic beverages	A	$\$_A$
beef	B	$\$_B$
coffee	C	$\$_C$
gasoline	G	$\$_G$
sugar	S	$\$_S$
tobacco	T	$\$_T$
unknown balance	U	$\$_U$

Figure 17

For if $a_{jk} = \frac{\partial j}{\partial k}$, and if P =

and B, G, and M are independen

$$a_{PB} = \frac{\partial}{\partial}$$

$$dP = \frac{\partial P}{\partial B}dB + \frac{\partial}{\partial}$$

Integrating, we get

$$P = \int \frac{\partial P}{\partial B}dB + \int \frac{\partial P}{\partial G}$$

If the a_{jk} are constant coeffi $\partial j/\partial k$, are constant also and of the integrals. Therefore,

$$P = \frac{\partial P}{\partial B}\int dB + \frac{\partial P}{\partial G}$$

$$P = \frac{\partial P}{\partial B}B + \frac{\partial P}{\partial G}$$

Then where B, G, and M are functions of the prices of beef, gasoline, and miscellaneous, respectively, and a_{PB}, a_{PG}, and a_{PM} are constant coefficients defining the amount by which each of the functions B, G, and M affect the sales, P, of petroleum products. We are assuming that B, G, and M are variables independent of each other.

If the availability or price of gasoline is suddenly changed, then G must be replaced by G + ΔG. This causes a change in the petroleum sales from P to P + ΔP. Also we will assume that B and M remain constant when G changes to G + ΔG.

$(P + \Delta P) = a_{PB}\,B + a_{PG}\,(G + \Delta G) + a_{PM}M$.

Expanding upon this expression, we get

$P + \Delta P = a_{PB}\,B + a_{PG}\,G + a_{PG}\,\Delta G + a_{PM}\,M$

and subtracting the original value of P we get for the change in P

Change in $P = \Delta P = a_{PG}\,\Delta G$

Dividing by ΔP we get

$a_{PG} = \Delta P/\Delta G$

In general, a_{jk} is the partial rate of change in the sales effect j due to a change in the causal price function of commodity k. If the interval of time were infinitesimal, this expression would be reduced to the definition of the total differential of a function, P. See Figure 17.

When the price of gasoline is shocked, all of the coefficients with round G (2G) in the denominator are evaluated at the same time. If B, G, and M were independent, and sufficient for description of the economy, then three shock tests would be necessary to evaluate the system.

There are other factors which may be represented the same way.

Figure 18

$$\phi = \frac{\partial \phi}{\partial C}C + \frac{\partial \phi}{\partial W_P}W_P + \cdots$$

Figure 19

$$\begin{vmatrix} \frac{\partial r}{\partial c} & \frac{\partial r}{\partial s} & \cdots & \frac{\partial r}{\partial u} \\ \frac{\partial r}{\partial c} & \frac{\partial r}{\partial s} & \cdots & \frac{\partial r}{\partial u} \\ \cdots & \cdots & \cdots & \cdots \\ \frac{\partial r}{\partial c} & \frac{\partial r}{\partial s} & \cdots & \frac{\partial r}{\partial u} \\ \frac{\partial \phi}{\partial c} & \frac{\partial \phi}{\partial s} & \cdots & \frac{\partial \phi}{\partial u} \end{vmatrix} \cdot \begin{vmatrix} c \\ s \\ \cdot \\ \cdot \\ u \end{vmatrix} = \begin{vmatrix} r - x_r \\ \cdot \\ \cdot \\ \cdot \\ \phi - x_\phi \end{vmatrix}$$

$= [a_{jk}]\,[x_k] = [x_j]$ $\quad x_k \quad x_j$

where the a_{jk} are defined by $a_{jk} = \frac{\partial x_j}{\partial x_k}$.

For example, the tendency of a docile sub-nation to withdraw under economic pressure may be given by the equation in Figure 18 where G is the price of gasoline, W_P is the dollars spent per unit time (referenced to say 1939) for war production during "peace" time, etc. These quantities are presented to a computer in matrix format as in Figure 19 and,

$X_1 = G \qquad Y_1 = P - KP$

$X_2 = B \qquad Y_2 = F - KF$

$X_3 = \text{etc.} \qquad Y_3 = \text{etc.}$

Finally, inverting this matrix, i.e., solving for the X_k terms of the Y_j, we get, say,

$[bk_j]\,[Y_j] = [X_k]$

This is the result into which we substitute to get that set of conditions of prices of commodities, bad news on TV, etc., which will deliver a collapse of public morale ripe for take over.

Once the economic price and sales coefficients a_{jk} and b_{kj} are determined, they may be translated into the technical supply and demand coefficients g_{jk}, C_{jk}, and $1/L_{jk}$.

Shock testing of a given commodity is then repeated to get the time rate of change of these technical coefficients.

Introduction to Economic Amplifiers

Economic amplifiers are the active components of economic engineering. The basic characteristic of any amplifier (mechanical, electrical, or economic) is that it receives an input control signal and delivers energy from an independent energy source to a specified output terminal in a predictable relationship to that input control signal.

The simplest form of an economic amplifier is a device called advertising.

If a person is spoken to by a TV advertiser as if he were a twelve-year-old, then, due to suggestibility, he will, with a certain probability, respond or react to that suggestion with the uncritical response of a twelve-year-old and will reach into his economic reservoir and deliver its energy to buy that product on impulse when he passes it in the store.

An economic amplifier may have several inputs and output. Its response might be instantaneous or delayed. Its circuit symbol might be a rotary switch if its options are exclusive, qualitative, "go" or "no-go," or it might have its parametric input/output relationships specified by a matrix with internal energy sources represented.

Whatever its form might be, its purpose is to govern the flow of energy from a source to an output sink in direct relationship to

an input control signal. For this reason, it is called an active circuit element or component.

Economic Amplifiers fall into classes called strategies, and, in comparison with electronic amplifiers, the specific internal functions of an economic amplifier are called logistical instead of electrical.

Therefore, economic amplifiers not only deliver power gain but also, in effect, are used to cause changes in the economic circuitry.

In the design of an economic amplifier we must have some idea of at least five functions, which are:

8. the available input signals
9. the desired output-control objectives,
10. the strategic objective,
11. the available economic power sources,
12. the logistical options.

The process of defining and evaluating these factors and incorporating the economic amplifier into an economic system has been popularly called *game theory*.

The design of an economic amplifier begins with a specification of the power level of the output, which can range from personal to national. The second condition is accuracy of response, i.e., how accurately the output action is a function of the input commands. High gain combined with strong feedback helps to deliver the required precision.

Most of the error will be in the input data signal. Personal input data tends to be specified, while national input data tends to be statistical.

Short List of Inputs

Questions to be answered:
- what
- where
- why
- when
- how
- who

General sources of information:
- telephone taps
- analysis of garbage
- surveillance
- behavior of children in school

Standard of living by:
- food
- shelter
- clothing
- transportation

Social contacts:
- telephone – itemized record of calls
- family – marriage certificates, birth certificates, etc.
- friends, associates, etc.
- memberships in organizations
- political affiliation

The Personal Paper Trail

Personal buying habits, i.e., personal consumer preferences:
- checking accounts
- credit-card purchases
- "tagged" credit-card purchases – the credit-card purchase of products bearing the UPC (universal product code)

Assets:
- checking accounts
- savings accounts
- real estate
- business
- automobile, etc.
- safety deposit at bank
- stock market

Liabilities:
- creditors
- enemies (see – legal)
- loans

Government sources (ploys)*:
- Welfare
- Social Security
- USDA surplus food
- doles
- grants
- subsidies

* *Principle of this ploy – the citizen will almost always make the collection of information easy if he can operate on the "free sandwich principle" of "eat now, and pay later."*

Government sources (via intimidation):
- Internal Revenue Service
- OSHA
- Census
- etc.

Other government sources – surveillance of US mail.

Habit Patterns – Programming

Strengths and weaknesses:
- activities (sports, hobbies, etc.)
- see "legal" (fear, anger, etc. – crime record)
- hospital records (drug sensitivities, reaction to pain, etc.)
- psychiatric records (fears, angers, disgusts, adaptability, reactions to stimuli, violence, suggestibility or hypnosis, pain, pleasure, love, and sex)

Methods of coping – of adaptability – behavior:
- consumption of alcohol
- consumption of drugs
- entertainment
- religious factors influencing behavior
- other methods of escaping from reality

Payment modus operandi (MO) – pay on time, etc.:
- payment of telephone bills
- energy purchases
- water purchases
- repayment of loans
- house payments
- automobile payments
- payments on credit cards

Political sensitivity:
- beliefs
- contacts
- position
- strengths/weaknesses
- projects/activities

Legal inputs – behavioral control (Excuses for investigation, search, arrest, or employment of force to modify behavior)
- court records
- police records – NCIC
- driving record
- reports made to police
- insurance information
- anti-establishment acquaintances

National Input Information

Business sources (via IRS, etc.):
- prices of commodities
- sales
- investments in
  - stocks/inventory
  - production tools and machinery
  - buildings and improvements
  - the stock market

Banks and credit bureaus:
- credit information
- payment information

Miscellaneous sources:
- polls and surveys
- publications
- telephone records
- energy and utility purchases

Short List of Outputs

Outputs – create controlled situations – manipulation of the economy, hence society – control by control of compensation and income.

Sequence:

91. allocates opportunities.
92. destroys opportunities.
93. controls the economic environment.
94. controls the availability of raw materials.
95. controls capital.
96. controls bank rates.
97. controls the inflation of the currency.
98. controls the possession of property.
99. controls industrial capacity.
100. controls manufacturing.

101. controls the availability of goods (commodities).
102. controls the prices of commodities.
103. controls services, the labor force, etc.
104. controls payments to government officials.
105. controls the legal functions.
106. controls the personal data files – uncorrectable by the party slandered.
107. controls advertising.
108. controls media contact.
109. controls material available for TV viewing
110. disengages attention from real issues.
111. engages emotions.
112. creates disorder, chaos, and insanity.
113. controls design of more probing tax forms.
114. controls surveillance.
115. controls the storage of information.
116. develops psychological analyses and profiles of individuals.
117. controls legal functions [repeat of 15]
118. controls sociological factors.
119. controls health options.
120. preys on weakness.
121. cripples strengths.
122. leaches wealth and substance.

Table of Strategies

See Table 1.

Diversion, the Primary Strategy

Experience has prevent that the simplest method of securing a silent weapon and gaining control of the public is to keep the public undisciplined and ignorant of the basic system principles on the one hand, while keeping them confused, disorganized, and distracted with matters of no real importance on the other hand.

This is achieved by:

• disengaging their minds; sabotaging their mental activities; providing a low-quality program of public education in mathematics, logic, systems design and economics; and discouraging technical creativity.

• engaging their emotions, increasing their self-indulgence and their indulgence in emotional and physical activities, by:

– unrelenting emotional affrontations and attacks (mental and emotional rape) by way of constant barrage of sex, violence, and wars in the media – especially the TV and the newspapers.

– giving them what they desire – in excess – "junk food for thought" and depriving them of what they really need.

• rewriting history and law and subjecting the public to the deviant creation, thus being able to shift their thinking from personal needs to highly fabricated outside priorities.

These preclude their interest in and discovery of the silent weapons of social automation technology.

The general rule is that there is a profit in confusion; the more confusion, the more profit. Therefore, the best approach is to create problems and then offer solutions.

Diversion Summary. Media: Keep the adult public attention diverted away from the real social issues, and captivated by matters of no real importance.

Schools: Keep the young public ignorant of real mathematics, real economics, real law, and real history.

Entertainment: Keep the public entertainment below a sixth-grade level.

Work: Keep the public busy, busy, busy, with no time to think; back on the farm with the other animals.

Consent, the Primary Victory. A silent weapon system operates upon data obtained from a docile public by legal (but not always lawful) force. Much information is made available to silent weapon systems programmers through the Internal Revenue Service. (See *Studies in the Structure of the American Economy* for an IRS source list.)

This information consists of the enforced delivery of well-organized data contained in federal and state tax forms, collected, assembled, and submitted by slave labor provided by taxpayers and employers.

Furthermore, the number of such forms submitted to the IRS is a useful indicator of public consent, an important factor in strategic decision making. Other data sources are given in the Short List of Inputs.

Consent Coefficients – numerical feedback indicating victory status. Psychological basis: When the government is able to collect tax and seize private property without just compensation, it is an indication that the public is ripe for surrender and is consenting to enslavement and legal encroachment. A good and easily quantified indicator of harvest time is the number of public citizens who pay income tax despite an obvious lack of reciprocal or honest service from the government.

Table 1: Table of Strategies

Do this:	To get this:
Keep the public ignorant	Less public organization
Maintain access to control	Required reaction to outputs (prices, points for feedback sales)
Create preoccupation	Lower defenses
Attack the family unit	Control of the education of the young
Give less cash and more data	More self-indulgence and more credit and doles
Attack the privacy of the church	Destroy faith in this sort of government
Social conformity	Computer programming simplicity
Minimize the tax protest	Maximum economic data, minimum enforcement problems
Stabilize the consent	Simplicity coefficients
Tighten control of variables	Simpler computer input data – greater predictability
Establish boundary conditions	Problem simplicity / solutions of differential and difference equations
Proper timing	Less data shift and blurring
Maximize control	Minimum resistance to control
Collapse of currency	Destroy the faith of the American people in each other

Amplification Energy Sources

The next step in the process of designing an economic amplifier is discovering the energy sources. The energy sources which support any primitive economic system are, of course, a supply of raw materials, and the consent of the people to labor and consequently assume a certain rank, position, level, or class in the social structure, i.e., to provide labor at various levels in the pecking order.

Each class, in guaranteeing its own level of income, controls the class immediately below it, hence preserves the class structure. This provides stability and security, but also government from the top.

As time goes on and communication and education improve, the lower-class elements of the social labor structure become knowledgeable and envious of the good things

that the upper-class members have. They also begin to attain a knowledge of energy systems and the ability to enforce their rise through the class structure.

This threatens the sovereignty of the elite.

If this rise of the lower classes can be postponed long enough, the elite can achieve energy dominance, and labor by consent no longer will hold a position of an essential energy source.

Until such energy dominance is absolutely established, the consent of people to labor and let others handle their affairs must be taken into consideration, since failure to do so could cause the people to interfere in the final transfer of energy sources to the control of the elite.

It is essential to recognize that at this time, public consent is still an essential key to the release of energy in the process of economic amplification.

Therefore, consent as an energy release mechanism will now be considered.

Logistics

The successful application of a strategy requires a careful study of inputs, outputs, the strategy connecting the inputs and the outputs, and the available energy sources to fuel the strategy. This study is called logistics.

A logistical problem is studied at the elementary level first, and then levels of greater complexity are studied as a synthesis of elementary factors.

This means that a given system is analyzed, i.e., broken down into its subsystems, and these in turn are analyzed, until by this process, one arrives at the logistical "atom," the individual.

This is where the process of synthesis properly begins, at the time of birth of the individual.

The Artificial Womb

From the time a person leaves the mother's womb, its every effort is directed towards building, maintaining, and withdrawing into artificial wombs, various sorts of substitute protective devices or shells.

The objective of these artificial wombs is to provide a stable environment for both stable and unstable activity; to provide a shelter for the evolutionary processes of growth and maturity – i.e., survival; to provide security for freedom and to provide defensive protection for offensive activity.

This is equally true of both the general public and the elite. However, there is a definite difference in the way each of these classes go about the solution of problems.

The Political Structure of a Nation – Dependency

The primary reason why the individual citizens of a country create a political structure is a subconscious wish or desire to perpetuate their own dependency relationship of childhood. Simply put, they want a human god to eliminate all risk from their life, pat them on the head, kiss their bruises, put a chicken on every dinner table, clothe their bodies, tuck them into bed at night, and tell them that everything will be alright when they wake up in the morning.

This public demand is incredible, so the human god, the politician, meets incredibility with incredibility by promising the world and delivering nothing. So who is the bigger liar? the public? or the "godfather"?

This public behavior is surrender born of fear, laziness, and expediency. It is the basis of the welfare state as a strategic weapon, useful against a disgusting public.

Action/Offense

Most people want to be able to subdue and/or kill other human beings which disturb their daily lives, but they do not want to have to cope with the moral and religious issues which such an overt act on their part might raise. Therefore, they assign the dirty work to others (including their own children) so as to keep the blood off their hands. They rave about the humane treatment of animals and then sit down to a delicious hamburger from a whitewashed slaughterhouse down the street and out of sight. But even more hypocritical, they pay taxes to finance a professional association of hit men collectively called politicians, and then complain about corruption in government.

Responsibility

Again, most people want to be free to do the things (to explore, etc.) but they are afraid to fail.

The fear of failure is manifested in irresponsibility, and especially in delegating those personal responsibilities to others where success is uncertain or carries possible or created liabilities (law) which the person is not prepared to accept. They want authority (root word – "author"), but they will not accept responsibility or liability. So they hire politicians to face reality for them.

Summary

The people hire the politicians so that the people can:

- obtain security without managing it.
- obtain action without thinking about it.
- inflict theft, injury, and death upon others without having to contemplate either life or death.
- avoid responsibility for their own intentions.
- obtain the benefits of reality and science without exerting themselves in the discipline of facing or learning either of these things.

They give the politicians the power to create and manage a war machine to:

- provide for the survival of the nation/womb.
- prevent encroachment of anything upon the nation/womb.
- destroy the enemy who threatens the nation/womb.
- destroy those citizens of their own country who do not conform for the sake of stability of the nation/womb.

Politicians hold many quasi-military jobs, the lowest being the police which are soldiers, the attorneys and CPAs next who are spies and saboteurs (licensed), and the judges who shout orders and run the closed union military shop for whatever the market will bear. The generals are industrialists. The "presidential" level of commander-in-chief is shared by the international bankers. The people know that they have created this farce and financed it with their own taxes (consent), but they would rather knuckle under than be the hypocrite.

Thus, a nation becomes divided into two very distinct parts, a docile sub-nation [great silent majority] and a political sub-nation. The political sub-nation remains attached to the docile sub-nation, tolerates it, and leaches its substance until it grows strong enough to detach itself and then devour its parent.

System Analysis

In order to make meaningful computerized economic decisions about war, the primary economic flywheel, it is necessary to assign concrete logistical values to each element of the war structure – personnel and material alike.

This process begins with a clear and candid description of the subsystems of such a structure.

The Draft (as military service)

Few efforts of human behavior modification are more remarkable or more effective than that of the socio-military institution

known as the draft. A primary purpose of a draft or other such institution is to instill, by intimidation, in the young males of a society the uncritical conviction that the government is omnipotent. He is soon taught that a prayer is slow to reverse what a bullet can do in an instant. Thus, a man trained in a religious environment for eighteen years of his life can, by this instrument of the government, be broken down, be purged of his fantasies and delusions in a matter of mere months. Once that conviction is instilled, all else becomes easy to instill.

Even more interesting is the process by which a young man's parents, who purportedly love him, can be induced to send him off to war to his death. Although the scope of this work will not allow this matter to be expanded in full detail, nevertheless, a coarse overview will be possible and can serve to reveal those factors which must be included in some numerical form in a computer analysis of social and war systems.

We begin with a tentative definition of the draft.

4. The draft (selective service, etc.) is an institution of compulsory collective sacrifice and slavery, devised by the middle-aged and elderly for the purpose of pressing the young into doing the public dirty work. It further serves to make the youth as guilty as the elders, thus making criticism of the elders by the youth less likely (Generational Stabilizer). It is marketed and sold to the public under the label of "patriotic = national" service.

Once a candid economic definition of the draft is achieved, that definition is used to outline the boundaries of a structure called a Human Value System, which in turn is translated into the terms of game theory. The value of such a slave laborer is given in a Table of Human Values, a table broken down into categories by intellect, experience, post-service job demand, etc.

Some of these categories are ordinary and can be tentatively evaluated in terms of the value of certain jobs for which a known fee exists. Some jobs are harder to value because they are unique to the demands of social subversion, for an extreme example: the value of a mother's instruction to her daughter, causing that daughter to put certain behavioral demands upon a future husband ten or fifteen years hence; thus, by suppressing his resistance to a perversion of a government, making it easier for a banking cartel to buy the State of New York in, say, twenty years.

Such a problem leans heavily upon the observations and data of wartime espionage and many types of psychological testing. But crude mathematical models (algorithms, etc.) can be devised, if not to predict, at least to predeterminate these events with maximum certainty. What does not exist by natural cooperation is thus enhanced by calculated compulsion. Human beings are machines, levers which may be grasped and turned, and there is little real difference between automating a society and automating a shoe factory.

These derived values are variable. (It is necessary to use a current Table of Human Values for computer analysis.) These values are given in true measure rather than US dollars, since the latter is unstable, being presently inflated beyond the production of national goods and services so as to give the economy a false kinetic energy ("paper" inductance).

The silver value is stable, it being possible to buy the same amount with a gram of silver today as it could be bought in 1920. Human value measured in silver units changes slightly due to changes in production technology.

Enforcement

Factor I

As in every social system approach, stability is achieved only by understanding and accounting for human nature (action/reaction patterns). A failure to do so can be, and usually is, disastrous.

As in other human social schemes, one form or another of intimidation (or incentive) is essential to the success of the draft. Physical principles of action and reaction must be applied to both internal and external subsystems.

To secure the draft, individual brainwashing/programming and both the family unit and the peer group must be engaged and brought under control.

Factor II – Father

The man of the household must be housebroken to ensure that junior will grow up with the right social training and attitudes. The advertising media, etc., are engaged to see to it that father-to-be is pussy-whipped before or by the time he is married. He is taught that he either conforms to the social notch cut out for him or his sex life will be hobbled and his tender companionship will be zero. He is made to see that women demand security more than logical, principled, or honorable behavior.

By the time his son must go to war, father (with jelly for a backbone) will slam a gun into junior's hand before father will risk the censure of his peers, or make a hypocrite of himself by crossing the investment he has in his own personal opinion or self-esteem. Junior will go to war or father will be embarrassed. So junior will go to war, the true purpose not withstanding.

Factor III – Mother

The female element of human society is ruled by emotion first and logic second. In the battle between logic and imagination, imagination always wins, fantasy prevails, maternal instinct dominates so that the child comes first and the future comes second. A woman with a newborn baby is too starry-eyed to see a wealthy man's cannon fodder or a cheap source of slave labor. A woman must, however, be conditioned to accept the transition to "reality" when it comes, or sooner.

As the transition becomes more difficult to manage, the family unit must be carefully disintegrated, and state-controlled public education and state-operated child-care centers must be become more common and legally enforced so as to begin the detachment of the child from the mother and father at an earlier age. Inoculation of behavioral drugs [Ritalin] can speed the transition for the child (mandatory). Caution: A woman's impulsive anger can override her fear. An irate woman's power must never be underestimated, and her power over a pussy-whipped husband must likewise never be underestimated. It got women the vote in 1920.

Factor IV – Junior

The emotional pressure for self-preservation during the time of war and the self-serving attitude of the common herd that have an option to avoid the battlefield if junior can be persuaded to go – is all of the pressure finally necessary to propel Johnny off to war. Their quiet blackmailings of him are the threats: "No sacrifice, no friends; no glory, no girlfriends."

Factor V – Sister

And what about junior's sister? She is given all the good things of life by her father, and taught to expect the same from her future husband regardless of the price.

Factor VI – Cattle

Those who will not use their brains are no better off than those who have no brains, and so this mindless school of jelly-fish, father, mother, son, and daughter, become useful beasts of burden or trainers of the same.

This concludes what is available of this document.

In Ohio, a Study in Contrasts as Two Campaigns Get Out Vote

By Monica Davey and Michael Wines, The New York Times, November 4, 2012

Cincinnati – Inside a peeling former nightclub here, Obama volunteers are perched on any seats they can find, trays of half-eaten sandwiches line an old mirrored bar and a hand-scrawled list of "office needs" includes toilet paper and Teddy Grahams.

But if this campaign office conveys a casual, ragtag feel, it belies a sprawling operation with an intricate chain of command, volunteers who have been here for years and a lexicon worthy of the military. Volunteer red, white and blue team captains bear particular duties for getting voters to the polls, not to mention "comfort captains," assigned to tend to coffee, meals and sore feet.

After extensive test runs the past few weekends for this election day get-out-the-vote machine, an Obama staff member held one final meeting with volunteers in a back room the other night, saying, "Next Tuesday, it's showtime!"

The Kenwood Romney Victory Center – one of but three in this county around Cincinnati, five fewer than the Obama camp – is 10 miles and a world away. Inside a suburban office building populated by insurance firms and walk-in medical clinics, there are no dry runs, no flowchart bureaucracy and fewer young faces; many of the 20 or so volunteers are north of middle age.

What there is, is passion.

As a marathon campaign in Ohio nears a conclusion that its weary residents surely yearn for, the contest between President Obama and Mitt Romney has devolved into political trench warfare. It is a close-quarters fight: Mr. Obama's operation, built over four years with more than a hundred offices around Ohio and hundreds more living rooms, office basements and even garages set aside as election day "staging locations," versus the raw anger, worry and drive of a more recent set of Romney organizers.

At age 62 still as earnest as a college student, Edward R. O'Donnell left his music production company in the hands of associates to walk neighborhoods for Mr. Romney, driven by a growing panic that government debt is dragging the nation into bankruptcy. Like many here, "I have never been involved in an election campaign before," he said. But, he added, "I committed months ago to doing anything and everything I can to try to change that direction."

The outcome rides largely on which campaign succeeds in getting its supporters to the polls by pestering, begging, calling, offering early-voting instructions or election day buses and then pestering some more. It is a competition that has played out here with paid workers and volunteers in a strange universe of sleep deprivation, interminable door-to-door marches through cold rains, borrowed guest rooms and donated junk food.

In Cincinnati, the signs of the showdown are everywhere – not just from the campaigns, but also from a vast array of groups that have descended, knocking on the doors of residents so exhausted by all the knocks that one resident warded off more by posting an announcement on her front door that she had voted early and was, thank you very much, done.

The fight is bitter, with reports of yard signs stolen, run over and even set afire, political phone calls so endless that at least one man was answering his home telephone by barking "Romney" rather than hello, and tales of front-door confrontations ending in curse words or worse.

"There's nothing coming in this house that has the word 'Obama' on it," one man told Liz Ping, an Obama volunteer, when she appeared at a doorstep. After the two disagreed over who ought to be blamed for the nation's debt, Ms. Ping, who is 61 and retired, was chased from the porch and down the driveway, she recalled.

"We're the tip of the spear," she said.

One rejected Romney door knocker said, "I just tell them, 'You can run me out of here, but somebody will be back next week unless you vote.'"

Publicly, at least, strategists on both sides here claim the edge.

The Obama campaign's extensive infrastructure is intended to include as many volunteers as possible without forcing them to drive long distances to take part, a senior campaign adviser said.

"The whole goal is to allow for everyone who wants to help us to go communicate to voters who are likely to vote for the president in every corner of the state," said the adviser, Aaron Pickrell. "So that's the purpose – it's not to have muscle and show that we have a bunch of offices."

The Romney campaign was dismissive. "There are places in the state where we don't have bricks and mortar," said Scott Jennings, a public relations executive from Louisville, KY, who directs Romney field operations in Ohio. "But I didn't set out to build a campaign structure that had as its core function rent payments. I don't need to pay rent to somebody to achieve my door-knocking goals."

The President's People

The Obama campaign has been here so long that there has been time to decorate.

Offices are equipped with streamers, cheery multicolored posters, piles of charging campaign cell phones labeled "firing up" and even the occasional goofy riddle taped to a wall. Inside an office in Forest Park, north of Cincinnati, a "Let's Move Corner" provides jump ropes, Hula-Hoops and instructions for stretches ("Reach down to your grass roots") near a well-stocked snack table that on a recent morning included enough Krispy Kreme doughnuts that Michelle Obama, had she seen them, surely would have cringed.

By now, though, no one is jumping rope. Or eating much.

Any frivolity has been eclipsed in these final hours, overtaken by exhaustion, tension and an overriding focus on meeting this operation's carefully monitored numerical goals for volunteers signed up, doors knocked on, voters met. "Can I ask you to run a marathon for us in the last four days?" a young staff member in jeans earnestly beseeched a white-haired volunteer as he stepped into the Forest Park office.

The essential theory in Obamaland: in a world of cell phones and caller ID, a door knock from a neighbor who can say, for instance, what high school he went to around here will be far more effective at luring a voter to the polls than a call from a stranger in some faraway state.

And so, for months, neighborhood teams have canvassed at houses they have now grown thoroughly familiar with – and some of which can expect three more inquiries on Tuesday alone, unless and until their occupants have voted.

Before then, these visits are intended, in part, to get Obama-leaning residents with histories as inconsistent voters to form a specific plan for voting this time, whether by pondering aloud what time of day they

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might go on Tuesday or by remembering to mail in the absentee ballot that records show they have requested.

"When do you want to go ahead and do it?" Irvin Carney, a 24-year-old volunteer, asked a woman at her front door on a recent evening after she said she favored Mr. Obama. "Want to say you'll do it early next week? Monday? How're you going to get there?"

The Obama operation established itself here by 2008, winning Ohio and, to the shock of local leaders in the county that surrounds this city, Hamilton, which had long favored Republican presidential candidates. Then it never left. At least one staff organizer stayed put, keeping a desk for a while in the cluttered county Democratic office. Some in the old network of volunteers remained too, occasionally summoned to work phone banks for Mr. Obama's health care law or efforts to oppose Ohio legislation to limit early voting.

By October 2011, some among the 2008 "Neighborhood Team Leaders," top local volunteers like Michele Fisher, began holding monthly meetings for the re-election effort.

"It seemed early then, but we've been going ever since," said Ms. Fisher, 55, an owner of bagel shops in the area. On election day, she will serve as director of one of this county's scores of campaign staging locations – the volunteered living rooms, alcoves and basements where team captains responsible for polling places (red), logistics (white) and canvassing (blue) will focus on getting people to vote.

If anything, the operation here looks similar to the one from 2008, just more established, more polished.

The technology has grown elaborate: rather than using only old-fashioned printouts of addresses and maps in manila folders, some volunteers use smart phones to be directed to homes the campaign wishes to target and then send back results of their stops electronically. Campaign officials will not say how many paid staff members have flooded into Ohio by now, though they seem to be everywhere, and volunteers in Ohio number in the thousands – some from other states but mostly, volunteers here say, locals.

"We're kicking their tails!" Mayor Mark L. Mallory of Cincinnati, an Obama supporter, said of the comparative ground games after emerging from a last-minute meeting with a small group of Obama volunteers. One reason for Mr. Mallory's confidence about the Obama campaign's efforts: his own father, William L. Mallory Sr., a longtime former state lawmaker, got a call the other day from the campaign, which noted, accurately, that he had not yet voted early. It urged him to do so.

Still, imperfections have emerged. Some volunteers sign up to appear for door-knocking shifts but "flake" when a Saturday afternoon arrives cold and wet. From time to time, the campaign has shown flashes of arrogance, at least one local Democratic leader says, not always giving enough attention to its supporters and volunteers. And some addresses on what should by now be a carefully culled list turn out not to be homes at all, like a shuttered industrial building the other night.

"I don't feel like I've been overly effective," Skip Tate, 50, said a little gloomily after volunteering for a long afternoon of climbing steps in a steep-hilled neighborhood. So few people answered their doors that Mr. Tate finally accosted a passer-by just to have someone – anyone – he could urge to vote.

The entire task of building this largely volunteer operation has changed since four years ago as the novelty of Mr. Obama's first run has faded some. Caleb Faux, the executive director of the Hamilton County Democratic Party, said he had observed an increase among black volunteers, but a drop among some white liberals who helped Mr. Obama four years ago.

Among the pack of outside groups on both sides leading their own parallel campaigns here, unions say they have seen an increase in volunteers – passions driven more now perhaps by fury over Republican state leaders' recent efforts to reduce early voting hours and to limit collective bargaining rights. "If Mitt Romney and Paul Ryan get elected, woe be to us!" Robert H. Baker, a transit union leader, told a room full of union members who gulped coffee as they prepared to head out into drizzle on a recent morning to knock on labor's own list of doors.

For the Obama campaign itself, there is no shortage of volunteers now, people here insist, but the wild, rushing emotions of 2008 have been replaced for some with a sense of determination and seriousness.

"It was sort of like a giddy high school kind of thing," Ms. Fisher said of the first Obama election. "You were so excited. It was just something new, that you were really going to make a change. And we did. And we're going to keep it going. But I think a lot

of people this time around, they definitely still want to see him stay, but their lives are a lot different now."

The Challenger's Effort

Mr. Romney's Kenwood Victory Center, like the five others in metropolitan Cincinnati, is the antithesis of funky, the inverse of cool.

Its phone bank workers often connect to empty houses when even advocacy groups let computers do the dialing, and find the actual humans their workers talk to. The neighborhood door-knockers record their successes and failures in pencil, when many others have long switched to smart phones tied wirelessly to databanks.

But neither advanced technology nor uber-organization nor a carpeting of campaign offices drive Mr. Romney's campaign. Rather, it is people like Henry and Donna Peters, a stream of volunteers that swelled to a flood after Mr. Romney's strong showing in last month's presidential debates.

"For a 67- and 65-year-old to get out of bed every Saturday morning – and other mornings – you have to feel very strongly about supporting a man who can make changes," Mr. Peters said.

He and Ms. Peters were driving to Blue Ash, a northeast Cincinnati suburb, to target likely Republican voters. She held a clipboard stuffed with campaign handouts and sheets of addresses to visit.

The Peterses are the ideal next-door neighbors, soft-spoken people so courteous that they assiduously avoided stepping on the lawns of the homes they visited. But they had intensity: political newcomers, they regularly trek from Kentucky, a safe Romney state, in hopes of tipping Ohio into the Republican column. And they are not alone.

"We focus on quality, not quantity," said Alex Triantafilou, the Hamilton County Republican chairman.

Mr. Triantafilou and campaign officials insist that Mr. Romney has overcome Republicans' early ambivalence to become his party's favorite, not just its nominee. "No one I'm talking to is complaining we've got the wrong guy," he said.

Maybe. In talks with grass-roots conservatives, Mr. Romney seems considerably less beloved than his opponent is despised. It is too late for conservatives to find a perfect candidate, George Brunemann, who is head of the Cincinnati Tea Party, said over a recent coffee. But "Obama can get people as different as white supremacists and Black Panthers to walk in the same direction," he added.

At Kenwood this particular Friday, a wall of sign-up sheets held names of nearly 300 volunteers, local residents and loyalists from afar. Lloyd Kelley, a 72-year-old retired administrative law judge, came to Kenwood from St. Louis, on the heels of workers from California and Tennessee and Louisiana. At the Westwood center in western Cincinnati, Nancy Pennell, a stay-at-home mother from Greenville, SC, who came on impulse, was knocking on doors with volunteers from Kentucky and California.

And there are flashes of over-the-top ardor, the sort suggesting that a campaign feels it is gaining the edge.

At a long table, Luke and Moriah Swanger, ages 10 and 11, worked the phones after finishing their home-schooling. "They don't like what's going on with the economy," said their father, Kraig, "and I said, 'If you don't like it, then do something about it.'"

Mr. Triantafilou said he had seen internal surveys that give Mr. Romney's supporters a wide edge in enthusiasm over Mr. Obama's. "We didn't have it in '08. We didn't have it in '06; we got creamed," he said. "But we've got it back."

For both the Romney and Obama campaigns, this is the culmination of a long winnowing of the voter rolls, a political gold-panning of Hamilton County's 800,000 residents and 347,000 households that washes away the unconvertible until only the nuggets – the persuadable and the committed – remain.

Here, the harvest of new information from data-mining, polls, focus groups and telephone and door-to-door surveys culls those households where an appeal for support would be wasted.

"The point is to try to build yourself a get-out-the-vote list in which, if everyone on the list voted, you'd win the election," said Mr. Jennings, the Ohio field operations director.

Now, with the end in sight, the time for persuasion has passed. The volunteers' single goal is to ensure that every known Romney supporter votes.

Money and Debt in Canada

By Derek Skinner

The Skinnermoney website is based in Canada and was created to publish *The Canadian Money Machines* by Derek Skinner. It offers this free electronic book that gives you an in-depth analysis of the banking process, money creation and the consequences of a debt based money system. It was written to help the common man learn more about what a climate of private money lending and debt has done to our culture.

Learn what financial reforms must take place and what rules must change to get monetary policy on our side. Hopefully you'll be shocked and angry enough to act. This is a guide for young professionals as to what the owners of the money machines don't want you to know about credit, politics, and power.

Learn the Money Game

Whether you are just beginning to learn about our monetary system or you possess knowledge of this shell game this is the one resource book you simply can't do without.

Originally the book was titled, *A Child's Guide to the Use and Abuse of Money* using George Bernard Shaw's famous introductory phrase because it deals with the fundamentals of monetary policy, but due to the resulting more grave aspect of the book it was retitled. However, the book is still appropriate and important for high school and university-aged people to read.

Addressing the Problem

The creation of money in Canada has been subjected to criminal degradation by a process copied from English practise. The government of Canada has all but abandoned its proper money creation function mandated within the clauses of the *Bank of Canada Act. The Canadian Money Machines* addresses this fact. It concludes with a review of several proposals for correcting the abuse and returning to a system that makes money work in the interests of all the people and improving the general health and welfare of Canada and Canadians.

Contact us today to learn more about the book and its author. The book is free, and once you read it please let us know your thoughts.

You can download and print it, make a CD, copy it and above all tell your e-list, or Facebook or Twitter friends. Help us to get all of Canada informed about the excess debt that is being used to deny us our rightful good fortune and peace of mind.

Most join an army of foot soldiers who have slogged the northeast suburbs since early summer. By last Wednesday, the campaign had knocked on doors 151,887 times in Hamilton County – an imposing figure, but deceptive, as many knocks went unanswered and many households were covered more than once.

The Swing State of Swing States

Thousands more were to be blitzed before election day.

"This is the first time in many cycles that the Republican presidential campaign has emphasized door-knocking over phone banks," Mr. Jennings said. Across Ohio, he said, Mr. Romney's campaign is knocking on 19 times as many doors as Senator John McCain's campaign did four years ago.

In large part, of course, that is because Mr. McCain's Ohio campaign was starved for money. But it also reflects reality: land lines are being replaced by cell phones that canvassers cannot reach, and those landlines that remain are so overwhelmed that owners have become deadened to appeals.

"Look, everybody in Ohio with a phone and a pair of scissors is going to figure it out sooner or later," Mr. Jennings said. "They're being bombarded. Everyone in Ohio has a robo-dialer."

Indeed, as of six days before the election, Mr. Romney's telephone banks had made 397,741 calls in Hamilton County alone, albeit far fewer were successfully completed.

Consider a recent evening at the Kenwood center, where Mr. Kelley punched buttons on a telephone linked to a computer database of numbers of likely Republican voters.

"Is this Mr. Weaver?" he asked.

The person on the other end immediately hung up.

The second call went better: "I'm calling to remind you and your husband to vote in this election," Mr. Kelley said, then exclaimed "Great!" when his target pledged to back Mr. Romney.

The third call reached an answering machine. Nobody answered the fourth. The fifth, sixth and seventh reached more answering machines.

"This is the fifth phone bank I've worked on," he said later. "I'd say that out of 10 people, on average, four aren't at home, one is undecided, three are Romney and one's Obama."

The Targets

It is the most expensive and technically sophisticated campaign in American history. But in the end, after months of work, after hundreds of hours of commercials and hundreds of thousands of front-porch visits and millions of telephone calls – after focus groups, fliers, yard signs and rallies – Shelley and Dennis Russell are unmoved.

Days before the polls open they are still undecideds, targets in the cross hairs of a yearlong political cannonade who somehow, miraculously have yet to be persuaded by either side.

Yet on closer inspection, it is no miracle. To the contrary, they personify the angst that defines the dying days of this especially bitter contest, an emotion that the campaigns have longed to capitalize on, but have never captured.

The Russells live with their three children in a white clapboard house in Blue Ash, in middle-class east Cincinnati. She is a payroll supervisor; he works for a towing company. Their oldest son, 18, heads to boot camp next February because military service will pay for a college education that his family cannot afford.

Their pay is steady, but even low inflation has eaten away their income. They wonder openly whether the system is broken. They say they doubt either candidate can fix it.

Mr. Obama, they say, is honest and has good ideas, but no spine to carry them out. "Obama says he's going to put more out for education," said Mr. Russell, who wants to improve his skills but lacks money for more schooling. "But like his medical plan, I highly doubt that what comes out the other end is going to be what went in.

"If you're willing as a leader to say, I'll get 100 percent – oh, I'll take 60 – you're not accomplishing what you set out to do. Do you really believe he's going to do it in next four years?"

Mr. Romney might run the country better, they say, but he is clueless about the average person's needs. Witness, Ms. Russell said, his comments about the 47 percent of Americans who pay no taxes or depend on government handouts. "Me personally, I've never been on public assistance," she said. "But I definitely have friends who are single mothers who could not go to work without it.

"To me, it shows he's in a different wage bracket than the rest of us," she said.

Mr. Russell scoffed at Mr. Romney's suggestion that children should borrow from their parents to pay college tuition instead of seeking government loans. It is a notion, he said, that only someone with wealthy parents would propose.

Then again, Ms. Russell said: "I don't know that that will make him worse than Obama – that he can do enough good that it will trickle down to us."

The Russells concede that their indecision is not for lack of information. Like virtually every family in Ohio, they have watched the debates, talked with friends and read the material hung on their doorknobs, although they have drawn the line at listening to robo-calls. In short, they have been drenched by a fire hose of creative persuasion of the quality and volume that only two billion-dollar campaigns could muster.

Still, Ms. Russell mused, it is not altogether clear what this monumental ground game has added up to.

"I think this is one of those races that could go either way," she said. "They both have enough money backing them.

"If they'd put some of that money to work instead, it'd be amazing."

❧ ❧ ❧

Our Comment. Money, like centipedes, is a very crawling affair, where there is a hole to be occupied, it is likely to fill it and take over. *W.K.*