

More on Stanley Jevons

Editor, *The Wall Street Journal*:

The interesting and informative article "Jevons' Attempt to Change the World" by William D. Grampp (Aug. 12) set forth the claims of Stanley Jevons as a pioneer in marginal utility theory. As a tribute to that many-sided genius, it is fitting to remark that he was a pioneer in many disciplines. In economic statistics, he was the first to make index numbers, the first to draw charts using logarithmic scales, the first to use geometric averages, and the first to analyze seasonal fluctuations.

Professor Grampp mentioned, in passing, Jevons' work on business cycles using empirical methods. About this particular work, Lord Keynes once said: "By using this method Jevons carried economics a long stride from the *a priori* moral sciences toward the natural sciences built on a firm foundation of experience."

Nowadays we call this type of work "econometrics" and it is interesting to note that Ragnar Frisch, who was given the first Nobel Prize in Economics for his econometric work, gave this definition of this new discipline: (Econometrics is) "a large scale attempt to realize the dream of Stanley Jevons. . . ."

Was Jevons' genius limited to economics? Far from it, he taught logic and invented and built an instrument that he christened "logical piano." (For the same reason, Hollerith—in the 20th Century—christened the first tabulating machines a "statistical piano.") The present electronic computers are the intellectual descendants of these two "pianos."

In one field, though, Jevons failed: He was so intrigued by the mystery of the "Brownian motion" of small particles that he bought himself a microscope to study it. He gave the wrong explanation. For the right one, we had to wait until the next century, and ask another genius, Einstein, to come up with the right answer.

And this is not the complete list of all the "firsts" that Jevons could accomplish in his whole life. The complete list will never be known, because his "whole life" was cut short. Jevons died in a drowning accident when he was only 46 years old.

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Jevons' Attempt to Change the World

By WILLIAM D. GRAMPP

Just 100 years ago the idea of marginal utility became a permanent part of economics. The change was so consequential that it is remembered as "the marginal revolution." Its centennial will be observed this summer at international conferences in Austria and Italy.

Marginal utility begins with the simple observation that the more we have of anything the less do we want still more of it and therefore the less will we pay to get still more. The observation does not seem particularly informative. It was made long before 1871. Adam Smith made it in 1776 and did not think it worth pursuing. It was made even more explicitly by another British economist, Nassau Senior in 1836, and he too did not pursue it.

So long as it was ignored, the world was the loser. Today, the principle has acquired a new authority. Consider its application to the problem of pollution. An economist does not ask what damage it does or even the damage in relation to the cost of prevention. His way is to ask what other things must be given up in order to reduce pollution by a certain amount. That is asking what is the marginal cost of reducing it and what is the marginal gain. If the former is greater, then pollution, as bad as it is, is not as bad as some other problems that should be looked after first.

A Central Question

The idea answers a question that is at the center of economics: What determines the relative price of a good? Not the price stated in money but in units of another good. For example, why is a bushel of wheat worth more than one bushel of corn, say, worth 1.1 bushels of corn?

The answer before 1871 was that 10% more labor is needed to produce wheat than corn. So the classical economists reasoned, especially Ricardo in 1817 who said relative prices are governed by relative labor quantities. Marx made this into something Ricardo did not intend—that capital is not productive and only labor is. The Russians for many years acted upon the Marxian view and consequently wasted a great deal of capital.

In 1871 the idea of marginal utility was used to answer the question of relative prices. Wheat is worth 10% more than corn because a bushel of it adds as much to total satisfaction

as 1.1 bushels of corn. William Stanley Jevons stated the idea this way in England. A related statement was made in Austria by Carl Menger and another two years later by the Frenchman, Leon Walras.

They were the principals of the marginal revolution. None knew the others or their work. That is not as unusual as it seems. Newton and Leibniz each invented calculus independently of the other. In economics, the idea of diminishing returns was put forward independently by four men in pamphlets published in a single month in 1815. Each applied the marginal principle to production. The men of the "seventies" applied it to consumption.

Of the three, Jevons brought together the cost of production theory of his predecessors and the theory of marginal utility, using both to explain relative prices. He has had more influence than Menger or Walras and has become first among equals. This is so in the English speaking world, and economics is a distinctive, though not a unique, property of it.

Jevons was born in 1835 into a middle class family of considerable intellectual distinction. His father was an inventor and a writer on economic and legal matters. His mother was a poet, and her father was a historian. His sisters were learned women, as his letters to them indicate. When he was 13, his father's business failed in the depression of 1848. The fluctuations of business later became a serious study with Jevons. He constructed a theory of the business cycle that tried to explain the regularity of 10-year cycles. He also developed a method of measuring price changes. These contributions would have given him a place in the history of economics, although a smaller one, even if he had not developed the theory of marginal utility.

Yet Jevons did not begin his studies with the subject of economics. He entered University College, London, at 17 as a student of chemistry and botany. He did not plan to take a degree. He meant to enter business on the first suitable opportunity. His intention was to acquire a fortune quickly, and then retire to a life of learning. Unlike the freshmen of 100 years later who look upon an education as a means of enlarging their income, Jevons looked upon an income as a means of enlarging his education. He did in fact leave college after two years to become assayer in the mint

of Sydney, Australia. That was shortly after the gold rush in Australia. The position was respectable, and the work was important. But neither engaged his full energies.

He took up meteorology and at 20 was making weather forecasts for a Sydney newspaper. He continued to read the novels of his time. Dickens was a favorite. Trollope was to be also. In his youth Jevons was much affected by "Jane Eyre" and said that like Helen Burns in the novel he could abominate crime while understanding the criminal. The remark shows an early interest in reform as well as in learning.

Today economists who excel at theory are inclined to stay away from reform movements, leaving them to people in sociology, political science and the other social studies which (it is no secret) are believed to be inferior to economics. Milton Friedman and Paul Samuelson do take a lively interest in reform. They are exceptional and are in the tradition of the nineteenth century. Economics then was a guide to change, and economists did not think their work was complete if they were not engaged in reform.

High Aspirations

Jevons wanted to engage in it in a large way, one that today would be alarming. He wished "to be good, not towards one, or a dozen, or a hundred, but towards the nation or the world." A young man with these aspirations today would be taken aside, warned against illusions of grandeur, and sent off to the mathematics department to learn differential equations.

Jevons believed that in order to help others he must learn economics thoroughly and become proficient in mathematics. While in Sydney he began to read the classics. He thought "The Wealth of Nations" was dull. Poor fellow. What must he have thought when he later came onto the true deserts in the history of the subject?

Jevons believed he had an insight into society that was denied to most people, and he proposed to use it. He did not, however, burst forth with a manifesto of non-negotiable propositions to be enacted immediately. Actually, he was diffident about his ability, expressing his belief quietly and shyly in a letter to his sister. He returned to England and college, giving up a handsome income and a secure future in Australia. His greatest regret was that his family might suffer financially.

The financial sacrifice meant little to him. He was rather disdainful about wealth. The attitude is not unusual among economists. They explain maximization (of which, incidentally, Jevons' marginal technique is the

essential part), but are not obliged to practice it. Jevons was told he should, and the advice tipped the balance in favor of his deciding not. Ironically, he recalled Tennyson's "Locksley Hall":

What is that which I should turn to, lighting upon days like these?

Every door is barr'd with gold, and opens but to golden keys.

When 24 or 25, he came onto the idea of marginal utility, quite on his own, never having read or heard of the economists who stated it before him. On February 19, 1860, he wrote a brief statement of the idea in his journal. That was two months after he had returned to college. He probably had the idea earlier, or glimmerings of it, and one may have been the insight he wrote his sister about the year before.

He used the idea to answer a question on the final examination that year. The examiner marked it wrong, and Jevons missed getting the first prize. Historians of economics have made much of the episode and of Jevons saying he would vindicate himself when he published "the true theory of economy." One feels some sympathy for the examiner whose name is not remembered, fortunately. One of us today might very well do just as he did if an undergraduate on a critical examination put forward a notion that no one in the profession had heard of and one that moreover seemed to be a truism, as marginal utility does seem to be. Jevons himself was not bitter. He said that between the examiner and himself there had been an understandable difference of opinion.

Making Men Think

Eleven years later, Jevons published "The Theory of Political Economy." It changed economics in time, and so too did the writing of Menger and Walras. They made men think differently about economic value. If they had done no more, the three would merit a place in the history of economics. Actually, they did more. That was to provide economics with an analytical device, a method of examining problems and a technique for solving them. It is the making of marginal comparisons, instead of comparing magnitudes on the whole or on the average.

This marginal approach to economics and to other social studies also can be traced to the man who wanted to do good for the world. It seems a poor thing for a job that large. Yet in its small and fussy way, it is helpful. It may not bring great good into being, but can bring bits and pieces of it and can prevent what good there is from being squandered.

After Jevons' death in 1882, a follower, Philip H. Wicksteed, said the economist cannot change the world. That is the work of the prophets and the poets. But the economist can show them how to do their work in a sensible way, Wicksteed said. "If he can give sight to some blind reforming Samson he too has served."

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