continuity in economic history. Continuity and discontinuity are devices of story-telling, telling the story of monetary policy over the past few months or the story of modern economic growth. They affect the consciousness of business, its philosophies and lesser matters, such as precedents and politics.

It is well to have a case in mind. The most important is that of the British industrial revolution. If it was a ‘revolution’, as it surely was, it happened sometime. There was a discontinuity, a before and after. When? Numerous dates have been proposed, down to the day and year: 9 March 1769, when Watt took out a patent on the high pressure steam engine and Arkwright on the cotton-spinning water frame; or 1 January 1760, when the furnaces at Carron Ironworks, Stirlingshire, were lit.

Such dating has of course an amateur air. A definite date looks clumsy on a plaque or scroll but the precision does not fit well with sophisticated story-telling. The discontinuity is implausibly sharp, drawing attention to minor details. The Great Depression did not start on 24 October 1929; the deregulation of American banking was not completed with the fall of Regulation Q. Nicholas Crafts (1977) has pointed out that the detailed timing of the industrial revolution should not overshadow the thing to be studied: that small beginnings do come labelled with their probabilities of developing into great revolutions. He is identifying a pitfall in story-telling. Joel Mokyr identifies another (1985, p. 44): rummaging among the possible antecedents from which the great oak of the industrial revolution grew is a bit like studying the history of Jewish dissenters between 50 BC and 50 AD. What we are looking at is the inception of something which was at first insignificant and even bizarre, though ‘destined to change the life of every man and woman in the West’.

What is destined or not destined to change our lives will look rather different to each of us. Each historian therefore has his or her own dating of the industrial revolution. Each sees another discontinuity. E.M. Carus-Wilson (1941, p. 41) spoke of an ‘industrial revolution of the 13th century’: she found that the fulling mill was ‘due to scientific discoveries and changes in technique’ and that it ‘altered the face of medieval England’. A.C. B Sheridan (1975, p. xix-xx) found in the late middle ages ‘a country travelling slowly along the road ... that it travelled so very much more quickly in Adam Smith’s day’. In the eyes of Marxist writers the 16th century was the century of discontinuity, when capitalism set off into the world to seek its fortune. John U. Nef, no Marxist, believed he saw an industrial revolution in the 16th century, centring on dates (1932), though admittedly slowed in the 17th century. A student of the 17th century itself, such as D.C. Coleman (1977), finds glimmerings of economic growth even in that disorderly age. The most widely accepted period for the industrial revolution is the late 18th century, especially the 1760s and 1770s (Mantoux, 1928; Landes, 1969), but recent students of the matter (Hartwell, 1962; Crafts, 1984) have found much to admire in the accomplishments of the early 18th century. W.W. Rostow (1960) placed the ‘takeoff into self-sustained growth’ in the last two decades of the 18th century, but others have observed that even by 1850 the majority of British people remained in traditional sectors of the economy. And later still there was a second industrial revolution (of chemicals, electricity, and internal combustion) and a third (of electronics and biology).

Wider perspectives are possible, encouraging the observer to see continuity instead. Looking at the matter from 1907, the American historian Henry Adams could see a ‘movement from unity into multiplicity, between 1200 and 1900, ... unbroken in sequence, and rapid in acceleration’ (p. 498). The principal modern student of the industrial revolution, R.M. Hartwell, argued for continuity against the 17th century (1965, p. 78), ‘Do we need an explanation of the industrial revolution? Could it not be the culmination of a most unsuspectacular process, the consequence of a long period of economic growth?’

Such questions of continuity and discontinuity are asked widely in economics, though sometimes half consciously. They should not be left to historians. Economics is mainly contemporary history, and faces the problem of deciding when a period of history has been so profound that one can speak of the crucial discontinuity in the growth of big government, as Robert Higgs (1987) points out, might be placed when the institutions of centralized intervention were conceived (1900–1918) or made (1930–45) or expanded (1960–70). Even recent history faces this narrative problem. When, if ever, did purchasing power parity break down in the 1970s? When did price controls on antirabies vaccine begin to favour mergers? When did monetary policy last become expansionary? Where is the break?

The difficulty in answering the question has often been misconstrued as philosophical. The philosophical difficulty was first articulated in the 5th century BC by Parmenides and his student Zeno: that if everything is perfectly continuous, change is impossible (Kornet, 1967). Everything is so to speak packed too tightly to move. The economist will recognize the problem as analogous to an extreme form of economic equilibrium, or to the physicist’s maximum entropy. If human nature doesn’t ‘really’ change, then history will be a string of weary announcements that the more things change the more they stay the same. If the economy is ‘really’ in equilibrium all the time, then nothing remains to be done.

Alexander Gerschenkron, the economic historian who has contributed most to the understanding of continuity and discontinuity in economics, noted that such a metaphysics would close the book of history (1962, p. 12). A history of economics that began with the Parmenidean continuum would never speak.

For purposes of social science Gerschenkron rejects the transition from the connectedness of all things to an absence of connection. True, one can draw a smooth and fit a curve and no economic change looks discontinuous in the mathematical sense; but it is wrong then to deduce that ‘really’ there is no change at all, or that the industrial revolution is a mirage. ‘Continuity’ in the strict mathematical sense must be kept distinct from ‘continuity’ in the story-telling sense.

Economists have often been muddled about this philosophical distinction, drawing squint and fit a curve and omitting implications from it. Alfred Marshall enshrined on the title page of his Principles the motto ‘natura non facit saltum’ (nature does not make a jump; Leibnitz had invented it as ‘la nature ne fait jamais des sauts’). Marshall himself perhaps believed that the ability to represent behaviour with differentiable functions implies that marginalism is a good description of human behaviour. It is less clear how, on the other hand, Marshall understands jumps in nature (this on the eve of quantum physics) implies people should not jump either, and should change society only gradually. Anyway, both implications are non sequiturs. Though both have been attributed to neoclassical economics, neither is necessary for it. Much bitter controversy has assumed that neoclassical economics depends on smooth curves and in consequence must advocate smooth social policies. The peculiar alliance between discrete mathematics and Marxist economics has this origin, as does the enthusiasm of some conservative writers for continuities in economic history. Gerschenkron cursed both their houses; the social scientist should study change and continuity ‘unbothered by the lovers and haters of revolutions who must find themselves playgrounds and battlegrounds outside the area of serious scholarship’ (p. 39).

In one sense of ‘continuity’ it is trivial that economic history is continuous. History has causes (the fourth of five historically relevant definitions that Gerschenkron distinguishes). Continuity, then, can be viewed as being merely an impressively long causal chain. The exploitation of Scottish iron deposits in the 18th century was caused by bold investments, but these depended on a series of preconditions in technology, technology, and commerce, which depended on certain legal developments in the 16th century, and on the growth of political stability in the early 18th century, which in turn depended on all manner
of earlier events. Establishing continuities, as Gerschenkron
remarks, is the historian's purpose—or, one might add, the
economists', who is doing historian's work when he is not
doing philosopher's. The purpose might be to find a cause of
say, the Great Depression. It would be to find a chain of
events the absence of which would have made a difference:
the international irresponsibility of the United States, for instance,
as Kindleberger argued; or the domestic irresponsibility of the
Federal Reserve, as Friedman and Schwartz argued. Finding
such chains has its own philosophical difficulties (see the
article in this Dictionary on COUNTERFACTUALS).

The main problems of continuity and discontinuity, however,
are not considered in seminars on philosophy. They are
practical problems in the uses of measurement, and must be
solved in the economic or historical workshop. When shall we
say that the industrial revolution happened? Gerschenkron
gives an answer confined to industry, for in common with
most economic historians he regards agriculture and services
as laggards in economic growth.

In a number of major countries of Europe... after a
lengthy period of fairly low rates of growth came a
moment of more rapid growth, and then remained at the
accelerated level for a considerable period. That was the
period of the great spurt in the respective countries' industrial
development.... The rates and the margin between them in the 'pre-kink' and
the 'post-kink' periods appear to vary depending on the
degree of relative backwardness of the country at the time of
the acceleration (pp. 32-4).

The level at which such discontinuity is to be observed is at
choice. As Gerschenkron remarks,
If the seat of the great spurt lies in the area of
manufacturing, it would be useful to try to locate the
discontinuity by scrutinizing data on large aggregate
magnitudes such as national income.... By the time
industry has become bulky enough to affect the larger
aggregate, the exciting period of the great spurt may well
be over (pp. 34-5).

In a footnote to these sentences he remarks that 'Walt
Rostow's failure to appreciate this point has detracted greatly
from his concept of the take-off, which in principle is closely
related to the concept of the great spurt as developed by this
writer.'

The point is a good one, and applies to all questions of
continuity in aggregate economics. Small (and exciting)
beginnings will be hidden by the mass until well after they
have become routine. Joel Mokyr has put it as a matter of
arithmetical: if the traditional sector of an economy is growing
at a slow one per cent a year, and starts with 90 per cent
of output, the market share question growing at four per cent
a year will take three-quarters of a century to account for as
much as half of output (1985, p. 5). We may call it the
Weighting Theorem (or the Waiting Theorem, for the wait is
long when the weight is small to begin with). There are parallel
points to be made elsewhere in economics and in social science
in general. In growth theory, for instance, as was noticed
shortly after its birth, a century of theoretical time is needed in
most models for a shift to yield growth as much as 90 per cent of
its steady state. More generally, economists have long
recognized the tension between microeconomic explanations
and the macroeconomic things to be explained. And
sociologists have been quarrelling along similar lines for a
century, using even the same jargon of micro and macro.

In other words, the search for discontinuity in an aggregate
time series raises the question of the level at which we should
do our social thinking, the aggregation problem. Yet
Gerschenkron himself did not answer the question well, and
was hoist by his own petard. Calculating Italian industrial
output he placed his 'big spurt' in 1896-1908, and wished to
explain it with big banks founded in the 1890s. Stefano
Fenollosa, once his student, applied the Weighting Theorem to
the case (Fenollosa, 1987). Surely, Fenollosa reasoned, the
components of the industrial index—steel output and the
chemical output—are the 'real' units of economic analysis
(note the similarity of this rhetoric to that advocating a micro
foundation for macroeconomics). If the components started
accelerating before the new banks appeared, becoming bulky
only later, then the new banks could not have been the
initiating force. Alas, the components did just this. They spoil
Gerschenkron's bank-led story: the components accelerated
not in the 1890s but in the 1880s, not after but before the
banks. To paraphrase Gerschenkron on Rostow, by the time
the progressive components of industry had become bulky
enough to affect the larger aggregate, the exciting period was
well over.

Yet the moral is still Gerschenkron's: that continuity and
discontinuity are tools forged by the historian rather than
something inherently and invariably contained in the
historical matter.... [Al] l historians, in their different lines of
work, that creates continuities or discontinuities' (p. 38).
Gerschenkron nodded, but in nodding made the point.
The multiple datings of the industrial revolution make it, too. So
does any choice of smoothness or suddenness in economic
story-telling.

The point is that history, like economics, is a story we tell.
Continuity and discontinuity are narrative devices, to be
chosen for their story-telling virtues. Niels Bohr said once that
'It is wrong to think that the task of physics is to find out how
nature is. Physics concerns what we can say about nature.' It is
our say. We can choose to emphasize the continuous:
'Abraham begat Isaac; begat... begat... and Jacob begat
Joseph the husband of Mary, of whom was born Jesus.' Or the
discontinuous: There was in the days of Herod, the king of
Judaea, a certain priest named Zacharias. It is the same story,
but its continuity or discontinuity is our creation, not God's.
That it is out of God's hands does not make it arbitrary.
Scholars speak of the industrial revolution as early or late,
gradual or sudden. Other scholars believe or disbelieve their
stories on the usual grounds. 

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See also ECONOMIC HISTORY.

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