Six pieces on multiple causality

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96. Multiple causality

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Aristotle proposed a multiple causality. The *efficient cause* (e.g. carpenter) does something (makes furniture) with materials (*material cause*, e.g. wood) according to technology and craftsmanship (*formal cause*), in order to achieve an end (*final cause*), e.g. to create an income or to satisfy professional or creative will, depending on conditions that affect those causes (*conditional cause*, e.g. markets, institutions), possibly according to some model to be executed or example to be imitated (*exemplary cause*).

Aristotle applied this causality to nature, as if stars or falling objects have an end to which they move, and this idea was justifiedly relegated to the dungheap of the history of ideas. It was replaced by a simple mechanical notion of causality, as with billiard balls bumping into each other, or as a purely formal notion of consistent succession in time, with the effect invariably following upon the cause. The irony is that this single causality next became the ambition also of human and social science, while there Aristotelian multiple causality fits admirably.

Economists and social scientists talk about agents (efficient cause), their motivation (final cause), availability of means (material cause), know-how and technology (formal cause), under influence of markets and institutions (conditional cause).

According to criticism such explanation is not ‘real’ or ‘ultimate’ causality, which lies in the physics and chemistry of elementary particles, and all causality to be satisfactory must be *reduced* to that. The mind is based on the brain, which operates on the basis of neurons, ‘hence’ causality and explanation should be sought there. And then ‘we are our brain’. That *reductionism*, I claim, is invalid and not useful.

How far ‘down’ should one go in reduction? The *firing* of neurons is an electrochemical process, on the basis of molecules that in turn consist of elementary particles that in turn consist of elementary forces that may or may not be seen as vibrating strings. We are not sure yet. So, to be consistent we should descend to the level where we no longer know. How would that be better than, say, to surrender to belief in God?

The logic of explanation on a higher level is often quite different from that on a lower level. Consider Boyle’s law that when in a chamber a given amount of gas at a given temperature is compressed, pressure is inversely proportional to volume. That was an experimental law, discovered in 1662, which 76 years later could be explained as gas particles bumping into the wall of the chamber. But in the law itself we do not find those particles.

Doesn’t something like that also apply to the brain? Thinking may ultimately be based in electromagnetics of particles, but the latter do not thereby explain how thought works. A mere physiological explanation does not by itself explain why under certain conditions someone choses something.

An important point, however, is that a higher level causal theory must not be at odds with what on the lower level is physically possible. While a logic of thought need not be built up from a theory of elementary particles, it should not contradict what is possible on that level.

97. Proximate and ultimate goals

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Economists assume that people and firms go, and should go, for maximum utility or profit. But they don't tell you how to achieve such goals.

As I argued in the previous item of this blog, in human affairs it is useful to see causality as multiple, as proposed by Aristotle. And then goal achievement depends on several causes, which are all uncertain. The *efficient cause* (that which acts) of labour, people at work, is difficult to predict and to manage, especially in the growing segment of professional work. The *formal cause* (how things are done) of technology changes due to innovation. The *final cause* (for what purpose people act) varies and may be multiple. The *conditional cause* (circumstances that affect the other causes) of markets and institutions operates in a complex system of strategic interaction, herd behaviour, fads and fashions, and a political process of bumper cars in a fancy fair, which yields unforeseeable and partly unintended effects.

What is much more reasonable and feasible than trying to go directly for the ultimate outcome is to try to influence the different causal factors as more proximate goals, in directions that are likely to contribute to ultimate goals, but without certainty. Those proximate goals may also be seen as having value in and by themselves, as different dimensions of virtue and merit, again according to Aristotelian philosophy.

In life this is what people in fact do. How do you achieve happiness? By developing the factors that contribute to it and have value by themselves. Build and maintain friendships. Be good to loved ones. Develop empathy. Build an education that you enjoy. Enjoy art so that it may develop your sense and sensibility.

In economies, select appropriate actors, motivate them, provide knowledge and technology, and provide proper conditions.

Firms should aim to motivate labour, not merely as a means but also as an intrinsic value. It is well known that intrinsic motivation is often more powerful than only the extrinsic motivation of salary and bonus. People are motivated by self-interest, yes, but also by the will to make a contribution to something significant. People want to be autonomous, yes, but they also want to be part of a social entity and process.

Aim to develop knowledge as a value in itself, and as contributing to technology. The more fundamental research is the more uncertain its outcome. Planning innovation on the condition of predictable contribution to profit is self-defeating since it will yield only marginal improvement on what already exists. If fundamental innovation is too risky to go it alone, do it in collaboration with others to spread the risk.

Aim to make a contribution to the natural, social, cultural and economic environment that constitutes the conditions of success.

Create room for variety of ideas, internally, within an organization, and externally, in relations with suppliers and customers. Create a culture where failures are recognized and admitted, punished by blame only in case of misconduct. Organize opposition, to benefit from variety of ideas and experience. I refer here to earlier items (57, 58) in this blog, on *cognitive distance.*

98. Science and policy

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Why is it so difficult to connect science and policy, as in economic and social policy, and why is there so little effective communication between the two?

The connection suffers from two related, fundamental problems. First, science is mostly connected with the Cartesian ideal of an objective observer outside the field of study, in a separation of subject and object, in 'spectator theory'. In other words, the view that pragmatism opposes. Second, science is mostly associated with the *spirit of geometry* (see item 7 of this blog), in abstraction from the complexities and variability of specific conditions in which the world is observed. That is needed to argue rigorously, in deduction from premises. This also requires limitation of the range of perspectives one could take, in a specific disciplinary perspective.

Policy, by contrast, is applied in specific contexts and cannot afford all that. Universals must be embedded in specific contexts and must thereby be expanded with corresponding conditions and peculiarities that were eliminated in abstraction. It cannot afford to consider an isolated perspective but must simultaneously consider other possible and relevant perspectives. It must regard the specific context in all its richness and variability. In other words, it must exercise the *spirit of finesse.*

According to Blaise Pascal, the spirits of geometry and finesse cannot be mixed, like oil and water. So there lies the problem of scientific policy advice. What, then, to do? According to Pascal one can only alternate between the two. How is that to be done?

This problem is related, I believe, to the problem of incommensurability. Aristotle recognized that not all values are commensurable, cannot all be brought under a common denominator so that they may be added and subtracted, in a calculation of trade-offs. The assumption that this is always possible is an affliction of economic science. What is there to be done in such cases? All we can do is to try and clarify the contrasts among views or values in debate, with the aim to arrive at some reconciliation or some judgement of which perspective is the most relevant or valid in the case at hand. That is the job of the policy maker.

Can we find some further help, some instrument, in this process? I suggest that we can find this in multiple Aristotelian causality, discussed in preceding items in this blog. What could one say, in the particular context at hand, about the agents, means, motives, know-how, conditions and leading examples of the case at hand? Could insights from different perspectives be integrated along that scheme? Psychologists might say something useful about motives, economists or sociologists about the agents involved, economists about market conditions, sociologists about institutional conditions, social psychologists about social conditions, anthropologists about cultural conditions, sociologists about social network effects, organization scientists about organizational conditions, and engineers about technology. Would that help?

99. Role models

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One of the six causes proposed by Aristotle is the *exemplary cause.* It is a model or example to be emulated. The carpenter makes a chair after a model, the portrait painter uses a model, and in organizations and society there are role models. Adam Snith used the pin factory as a leading example of division of labour: one worker draws the wire, a second cuts it into pins, a third sharpens, and a fourth polishes them.

Exemplar is the original meaning of the term *paradigm.* That term has acquired a range of meanings, such as philosophical, scientific or political doctrine, or a set of basic perceptions, notions, assumptions, or methods. This suggests that at the source of these lies some exemplar that is emulated.

There is wisdom in this. Using the exemplar to be emulated or imitated is an alternative for a set of precise prescriptions, instructions, rules, or a protocol to be followed. Those do not do justice to the complexity and variability of human life, and conditions of practice. Complexity and variability arise in the diversity and change of specific contexts in which a practice is to be performed. Practice, of work, art, debate, thought, and life in general, are too variable and complex to be caught in strict, universal, fixed concepts and rules. I discussed this in earlier items of this blog (e.g. item 16), where I argued for an interplay between universals and contexts of application in which universals can shift. The exemplar is a universal with built-in room for variety.

Compared to strict rules or protocols, an exemplar leaves room for interpretation according to context. Thus it leaves room for individuality in work, and takes the variability and complexity of contexts into account. Such room for variety of practice is important especially for innovation, where ideas need to be adapted to novel challenges and opportunities.

Entrepreneurs, in business (Henry Ford), science (Einstein) and politics (Ghandi), are examples. They were originals, and what they did was difficult to reduce to strict prescriptions. It was more a matter of style. In retrospect one can reconstruct elements of it, such as efficiency from uniformity (Ford's assembly line), unity of time and space, in four dimensions (Einstein), non-violent protest (Ghandi).

But variations upon the theme arise. Assembly lines developed into new forms of production (*just-in-time, demand pull, self-regulating teams*). In nature, four dimensions developed into eleven. Protest adopted social media, and standing silent for hours on Taksim square in Istanbul. What is imitated and improvised upon is not just a logical principle involved but also a spirit in which forms of thought and action are found.

As a result, the imprint on practice of the original inventor can last a long time. In the economy we see this in family firms that parade the founding father. Imitating the exemplar becomes part of the culture of an organization. And then it can atrophy, becoming a myth, ritualized, and can then become rigid, dogmatic, inflexible and brittle, to ultimately crumble in the winds of change.

100. Explaining history: The case of the United East India Company

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Multiple, Aristotelian causality can help to explain history. Here I consider the example of the Dutch United East India Company in the 16t/17th century.

It all began when for some unknown reason the herring shifted their spawning grounds from the Baltic to the North Sea, which borders Holland. That left an unsatisfied demand for herring in the Baltic, as a commercial opportunity. This is an example of Aristotle's *conditional cause.* Entrepreneurs (the *efficient cause*) jumped at this opportunity, for the sake of profit (the *final cause*). The herring provided the *material cause.*

In *triangular trade,* herring caught in the North Sea could in the Baltic be traded for wood and grain, which could be shipped to Portugal and Spain to be traded for wine and spices that the Portuguese brought from the East. The Dutch had the advantage that their harbours thawed earlier, in the extreme cold of that epoch, called 'the little ice age', than those in the Baltic, which allowed them to go to the Baltic, arriving when the harbours thawed there, go to Portugal and return just before the harbours at home froze again, while for Baltic traders departure would be later and return would have to be earlier, precluding the round trip in a single season. That fluke of geography was another *conditional cause.*

Several innovations were required. One was the curing of herring to preserve it for the voyage. Another was the issue of shares to spread risks across multiple sailings. These are examples of the *formal cause:* how things are done.

Trade from Holland, from the North sea, had to compete with the Hanze cartel, entrenched since the 14th century, of cities along the river Ijsel in the East of what now is the Netherlands together with traders in the Baltic. This was another *conditional cause.*

The Hanze cartel controlled inland transport to the Baltic, as well as the sea passage around the North of Denmark. They exacted toll in proportion to the deck surface of passing ships. This provided an incentive for the Dutch to build ships with a narrow deck in combination with a spacious hold, which led to the innovation of the 'Flute' ship. The design and the wood technologies involved were derived from the technology of building dikes and sawing wood in windmills. That is all part of the *formal cause.*

The triangular trade was so profitable, to both the Dutch and the Spanish and Portuguese, that it was kept up even during the eighty-years war of rebellion of the protestant Dutch against the Catholic Spanish who then ruled the Netherlands.

Portuguese trade with the East started to fail due to internal political failure and strife. That provided an incentive for Holland to find a route of its own to the East. They first tried to go along the North, but the attempt stranded on polar ice, in Nova Zembla. Then they went south and found their way around the Cape of Good Hope in South Africa, where they built settlements for replenishment of stocks. That led to the development of the Dutch-speaking South-African community of the 'Boers' (Dutch for 'farmers'). Coming around the Cape to seek access to the East, the Dutch were first shipwrecked on the wild Australian West Coast, and subsequently chanced upon the isles of what now is Indonesia, where they settled trading posts and from there developed a colony.

In sum, the development was a largely coincidental confluence of opportunity, geographical location, and obstacles to be overcome (*conditional cause*), the supply of herring (*material*

cause), entrepreneurship (*efficient cause*), in the profit seeking of an emerging protestant society (*final* cause), and technology and innovation (*formal cause*).

289. Multiple causality of virtues published 12-11-2016

In a politics of virtue, which values and virtues are to be held in common, and which are to be left to individual choice? If we want to go beyond the negative freedom of being left alone, to include positive freedom for developing and realizing one's choice of the good life, what competencies and conditions are required, and which corresponding values and virtues? Which are of public and which only of private concern?

In this blog I have employed the multiple causality of action proposed by Aristotle (items 96 – 100). Would that help here as well?

To recall: Aristotle distinguished the following causes: *efficient* (agency), *final* (goals), *material* (means), *formal* (method, competence, technology), *conditional* (surrounding conditions surrounding), and *exemplary* (role models). What is the scope of one's agency: what room does one have to act, what does one want, what does one need for it in means and method, what are external conditions, and what are good examples to follow?

Here, the question would then be: which values or virtues belong to what causes, of action, and to what extent are they public or private?

For agency (*efficient* cause), the question is whether one is recognized as a legitimate agent, without discrimination, say. That is a public issue of *justice*, connected to human rights. But it is also a private issue, with the virtue of *taking responsibility* for one's actions.

The *final* cause is the choice one makes for the good life. That is a private issue, though developed in human relations, in the course of developing one's identity. It requires the virtue of *courage* to make a choice and stand by it, with *commitment* and *perseverance*. A minimum of courage is needed, but some people more than others relish risk and restlessness, in their striving for excellence, excitement, creative destruction, or adventure. That is fine, provided that it pursues positive, not negative power, as a matter of *justice*. Other people attach more value to composure, equilibrium, peace of mind. In Nietzschean terms: more Dionysus or more Apollo.

What is fitting, viable, or desirable, depends on talent, age, stage of development, being single or not, having children or not, the environment one lives in. Different activities have different standards of *excellence*. What is shared depends on groups. People congregate to share more values or virtues.

I think virtues are dynamic, in a double sense. They change as one develops, and they are needed to achieve development.

For positive freedom one needs access to what is needed for choosing and realizing the good life, in terms of means (*material* cause) and competence (*formal*). Those are in large part a public issue, with sufficient income and housing as a material need, and access to education, schooling, for the formal cause. That is part of *social justice*.

The *conditional* cause is the most complicated, in a mix of private and public. It entails legal institutions, ensuring justice. That includes assurance of negative freedom, with constraints on one's freedom for the sake of the freedom of others, but with a minimum of meddling, control, imposition, constraint. That entails the virtue of *moderation* and self-restraint, and, again, a matter of *taking responsibility*.

But since the human is socially constituted, conditions should not only constrain but also enable it in the pursuit of the good life. For that it needs individual values and virtues for human interaction. But institutions also should enable interaction, in competencies for collaboration. This is both a public and a private issue. It is an important part of education, schooling, formation, which should include critical reflection, formation of identity, expression, and social responsibility and capability.

All this requires capabilities and virtues of *empathy, patience, openness, willingness to listen, courage* to exercise voice, in making and accepting criticism, friendship in the form of *philia*, in projects with shared interests, with mutual commitment and *loyalty*, balancing interests of self and other. This requires *moderation,* and attachment not only of instrumental value to relationships but also intrinsic value. Here we find the old ethical principle of never using people only as means but also as ends in themselves. It requires an ability to engage in contests and accept losing them.

The core capability here is that of 'voice'. That requires the virtue of *reflection*, being reasonable, and the ability to weigh often incommensurable or even conflicting values and virtues, depending on specific circumstances of specific individuals, and to debate the dilemma's.

That is difficult to do well, and people who are proficient in it serve as role models, in the *exemplary* cause.