



Full circle: economics from scholasticism through innovation and back into mathematical scholasticism

Reflections on a 1769 Price essay: “Why is it that economics so far has gained so few advantages from physics and mathematics?”

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Abstract *Through the sixteenth and seventeenth centuries, European science slowly lifted itself out of the fog of Mediaeval scholasticism. A rational, quantified and mechanised world picture emerged. In 1769 an essay questioned why economics benefited so little from the use of mathematics and quantification. Today the opposite may be argued – the increasing loss of relevance of economics is associated with the use of mathematics. Based on Francis Bacon’s criticism of scholasticism, it is argued here that strong parallels exist between the decay of scholasticism and the decay of modern economics. From being a science of practice, late neoclassical economics has degenerated into “working upon itself”, as Bacon says about late scholasticism. Since the 1769 essay, economics has come “full circle”. The problem for economics is not then mathematics per se – mathematics is just one language in which science may decay.*

“Never will man penetrate deeper into error than when he is continuing on a road which has led him to great success”, says Hayek (1952) in his book, *The Counter-revolution of Science. Studies in the Abuse of Reason*. In the context of Kuhnian paradigm shifts, Hayek pictures a process of scientific decay that grows out of the excesses that follow from the very success of a particular set of ideas.

Scientific paradigms may, in this way, be seen as moving in trajectories similar to the trajectories of technologies. Mature technologies and mature scientific paradigms unleash search processes for fundamentally new ideas. Confronted with mature technologies, the markets for new ideas often provide a large diversity of solutions – the steam-powered car, the electrical car and the petrol-driven car were all competing at the turn of the last century. The market for ideas in economics, however, seems to become oligopolistic and less diverse, particularly after a great success as described by Hayek.

An increasing number of observers, both inside and outside of the economics profession, argue that the use of mathematics in economics in some areas has reached a point of diminishing or even negative returns. In Hayek’s terms,

reason is in a sense being “abused”. Nowhere is the effect of this abuse more obvious than in the reality of economic development, where the increasingly globalised economy seems to produce opposite effects of what standard economic theory predicts. Instead of a convergence of world income (towards factor-price equalisation), we find that while the rich nations enjoy sustained growth, 90 of the world’s nations were poorer in 1997 than in 1990.

In some fields of economics we seem to be at the end of a successful trajectory using quantification and mathematics in economics, a trajectory that had its humble beginnings around 1750. An unknown book that seemingly marks the start of this scientific trajectory or paradigm came up for sale in the fall of 1998. The book with the surprising title, *Why is it that Economics so Far has Gained so Few Advantages from Physics and Mathematics* was written by Johann Jacob Meyen and published in Berlin in 1770. The Royal Academy of Sciences in Berlin gave the title of the book as a price essay, which was won by Meyen.

Meyen’s book brings us to the mid-1750s, a period when the “old” science has decayed and the scientific development of the Enlightenment is being diffused to new areas, in this case to economics. A new attitude is about to be formed towards social affairs, due to what Hayek (1952) calls “the new mental habits acquired in the intellectual and material conquest of nature”. The price essay offered by the Prussian Academy of Science reflects a conscious concern that this process of learning from the exact sciences to economics was not taking place fast enough. The price essay helps introduce a great innovation, bringing mathematics – which in Meyen’s use of the word also means “quantification” – into economics. This was the beginning of the scientific trajectory that many today would claim continued too long on the road to success, and decayed into what Philip Mirowski (1994) call “physics envy”.

The focus of this paper is on the transition period, where the old science has entered into decay, pedantry and irrelevance. We shall argue that there are striking similarities in the process of decay and abuse of science as they gradually lose relevance and “decay” scientifically. The “decay” of the science of the scholastics thus presents surprisingly many similarities to the increasing loss of relevance which many observers and participants perceive in economics today. Based on this, we would argue that mathematics *per se* cannot be blamed for the loss of relevance. The parallel with the decay of the science of scholastics seems to indicate that mathematics is but one language in which a science may lose its relevance to the problems of the real world.

We are thus discussing the birth of quantification and the use of mathematics in economics, a science competing with the decaying and increasingly irrelevant science produced by the schoolmen. Originally the term “scholastic” signified things relating to schools and universities. With the decay of scholasticism, the term also took on a new derogatory sense of a pedantic and formal science dealing in logical subtleties far removed from the problems of real life. Based on Francis Bacon’s analysis of the decay of scholasticism, we compare the similarities of late scholasticism and today’s mathematical economics, and suggest that the Bacon’s formula for the way out is still the valid one.

The schoolmen as a prototype of success and decay of science

Dissatisfaction with the state of economics is growing. The following analysis by a well-known historian of the profession, Mark Blaug, is becoming almost mainstream:

Modern economics is “sick”. Economics has increasingly become an intellectual game played for its own sake and not for its practical consequences. Economists have gradually converted the subject into a sort of social mathematics in which analytical rigor as understood in math departments is everything and empirical relevance (as understood in physics departments) is nothing. If a topic cannot be tackled by formal modelling, it is simply consigned to the intellectual underworld. To pick up a copy of *American Economic Review* or *Economic Journal*, not to mention *Econometrica* or *Review of Economic Studies*, these days is to wonder whether one has landed on a strange planet in which tedium is the deliberate objective of professional publication. Economics was condemned a century ago as “the dismal science”, but the dismal science of yesterday was a lot less dismal than the soporific scholasticism of today (Blaug, 1998).

Comparing sterile economics to scholasticism is not new, and the parallel is a good one. Already in 1926 Danish economist L.V. Birck wrote an article in *Weltwirtschaftliches Archiv*, called “Moderne scholastik”[1] (“Modern scholasticism”) in which he discusses the theories of Böhm-Bawerk (Birck, 1926). The scholastics – or schoolmen – were the carriers of science in the Middle Ages. Schumpeter ascribes to this early school of economics most of the important principles found in Adam Smith’s *Wealth of Nations* (see de Roover, 1957). However, their science decayed and the scientists of the day were increasingly accused of pedantry and irrelevance.

Like neo-classical economics, in its extreme form scholasticism also “proves” things that contradict common sense and intuition. Samuelson’s factor-price equalisation, which will happen under free trade, is an example of counterintuitive scholasticism in economics. McCloskey (1985) makes the point about neo-classical economics proving counter-intuitive propositions very clearly. The example he uses is Fogel’s (1964) “proof” that the railroad was not important in the development of the USA, because railroads, compared to canals, only improved GDP by 2.5 per cent. This is like proving that the heart is an unimportant organ because it only represents 2.5 per cent of the weight of the human body. Robert Heilbroner (1971) asked the question “Is economics relevant?” The answer to that question has been increasingly “no”.

Clearly, the lack of historical knowledge and corresponding *Fingerspitzengefühl* is almost a prerequisite for economic scholasticism. Jacob Viner (1991) makes the point that “economists have succeeded in being as ahistorical as an educated man can perhaps possibly be”. This lack of historical knowledge contributes to what Veblen calls the contamination of instincts: an irrelevant education blocks what to practical people is “common sense”. In a similar vein, a distinguished committee of the American Economic Association pointed in 1991 to the danger that “graduate programs (in economics) may be turning out a generation of too many idiots savants, skilled in technique but innocent in real economic issues” (American Economic Association, 1991).

In the literature of the early eighteenth century, two authors stand out in their criticism of this same kind of pedantry, removed from real life, in

contemporary science: Jonathan Swift (1684-1754) in Ireland and Ludvig Holberg (1667-1745) in Denmark-Norway. Swift's *Travels into Several Remote Nations of the World*, published under the pseudonym Lemuel Gulliver, mocks the scientific establishment in England. This is particularly evident in Gulliver's visit to the land of the giants. In his *Erasmus Montanus*, Ludvig Holberg gives us a parody of the decayed logic of the scholastics, when a learned man makes the following proof to a poor woman: "A stone cannot fly. Mother Nille cannot fly. Therefore Mother Nille is a stone".

These authors were both very influential. In the mid-eighteenth century, a list of the ten most sold books in Denmark-Norway would have consisted of the Bible and nine works by Holberg. This mockery of contemporary science was no doubt an important part of the *Zeitgeist*: Swift's Gulliver appeared in 1726 and Holberg's *Erasmus Montanus* was written no later than 1727.

While Swift and Holberg popularised the mockery of scholastic science, the criticism of the schoolmen had started with Francis Bacon more than 100 years earlier. Bacon recognised the enormous potential for development of human knowledge. He consciously tried to infuse the spirit of exploration into his time by writing what he called "feigned history" – fiction written in order to influence the future path of the history of mankind. Bacon's utopia, New Atlantis, presents the world with its first research council, and with a whole range of future inventions. Bacon perceived "the never ending frontier of knowledge" and urged his time to march towards it (see Reinert and Daastøl, 1997).

However, the old scientific order stood in the way of such a task, and Bacon had to fight this state of scientific affairs in order to make way for the new world view. In our view, Bacon's description from 1605 in *An Essay on Human Learning* fits the problems of economics today in a number of ways. We have marked these points in italics:

Surely, like as many substances in nature which are solid, do putrefy and corrupt into worms; so it is the propriety of good and solid knowledge to putrefy and dissolve into a number of subtle, idle, unwholesome and, as I may term them, vermiculite questions, which have indeed a kind of quickness, and life of spirit, but no soundness of matter, or goodness of quality. This kind of degenerate learning did chiefly reign amongst the schoolmen, who, *having sharp and strong wits, and abundance of leisure, and small variety of reading, but their wits being shut up in the cells of a few authors* (chiefly Aristotle their dictator), *as their persons were shut up in the cells of monasteries and colleges, and knowing little history, either of nature or time, did, out of no great quantity of matter, and infinite agitation of wit, spin out unto us those laborious webs of learning which are extant in their books*. For the wit and mind of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff, and is limited thereby: but if it work upon itself, as the spider worketh his web, then it is endless, and brings forth indeed cobwebs of learning, admirable for the fineness of thread and work, *but of no substance or profit* (Bacon, 1605).

As in Bacon's analysis, very capable and intelligent individuals produce today's economic scholasticism. However, their limited reading and very limited knowledge of history cause them to produce "webs of learning" which are irrelevant, and even counterproductive.

The advances of the natural sciences slowly increased their influence on economic theory. "Never can pride in the achievements of the natural sciences

and confidence in the omnipotence of their methods have been more justified than at the turn of the eighteenth and nineteenth centuries”, says Hayek (1952). It is therefore natural that this period represents the start of “physics envy” in economics and, from the point of view of economic policy, David Ricardo was the starting point in this “decay”.

Cambridge professor H.R. Foxwell, who was born in 1849, knew the history of economic thought better than most. Foxwell put together the two largest collections of historical economics books and pamphlets that exist to this day; the Goldsmiths’ Collection at the University of London and the Kress Collection at Harvard Business School. To Foxwell, the problems in economics started with David Ricardo. In his biographical article on Foxwell, Keynes (1972) informs us that such was Foxwell’s dislike of Ricardian economics that he refused to deliver the presidential address on Ricardo to the Royal Economic Society.

Foxwell wrote in 1899:

Ricardo, and still more those who popularised him, may stand as an example for all time of the extreme danger which may arise from the unscientific use of hypothesis in social speculations, from the failure to appreciate the limited applications to actual affairs of a highly artificial and arbitrary analysis. His ingenious, though perhaps over-elaborated, reasonings became positively mischievous and misleading when they were unhesitatingly applied to determine grave practical issues without the smallest sense of the thoroughly abstract and unreal character of the assumptions on which they were founded (Foxwell, 1899).

This criticism could indeed have been tailor-made today to criticise the devastating affects on welfare in the Second and Third World produced by neo-classical economics. This kind of theoretical “mischief” among other things caused a fairly conscious de-industrialisation of the Second and Third World which has been an important factor in causing the rapid decrease in real wages in these nations.

The start of a new scientific trajectory: Meyen’s 1769 price essay, “Why is it that economics so far has gained so few advantages from physics and mathematics?”

In the fall of 1998 a book with a surprising title appeared for sale at a Hamburg auction house – *Why Is It that Economics so Far Has Gained so Few Advantages from Physics and Mathematics*, with the subtitle, *And How Could These Sciences be Introduced in Order to be Generally Useful in Economics, and How Could One, by Connecting these Sciences, Arrive at Principles which Are of Practical Use?* The author of the book was Johann Jacob Meyen, and the date of publication 1770. The original German title is: *Wie kommt es, dass die Oekonomie bisher so wenig Vortheile von der Physik und Mathematik gewonnen hat; und wie kann man diese Wissenschaften zum gemeinen Nutzen in die Oekonomie einführen, und von dieser Verbindung auf Grundsätze kommen, die in die Ausübung brauchbar sind?*

This author acquired the book, which had been published in Berlin by Haude & Spener in 1770. The book is seemingly rare; it does not appear in any of the

standard bibliographies and collections of economics books of the period, i.e. Kress, Goldsmith, Einaudi, Humpert or Higgs. A search in the catalogues of German university libraries located four other copies of the book. In the German libraries the book is catalogued under its first title page, in French. The rest of the book is written in German, and there is also a second title page in that language.

The title of Meyen's book is even more interesting when it becomes clear that the title of the book is a question put forward as a prize essay by the Royal Academy of Sciences of Prussia for 1769. The subject of the use of mathematics in economics was not the idea of a single outsider, it was a subject important enough to be put forward as a prize essay by one of the most prestigious scientific academies of the period. The use of quantitative measures was apparently seen as a way of improving man's lot.

This book won the Academy's prize. The author, Johann Jacob Meyen, is not well known. He was born on November 26, 1731 in Colberg in Hinterpommern (Lower Pomerania) and died on March 8, 1797 in Stettin[2]. Meyen studied in Königsberg, later in Halle, where the first chair in economics had been established in 1728. He studied theology, and at the time he wrote the prize essay, he worked as a priest in Koblenz (not the Koblenz of the confluence of the Moselle and the Rhine, but Koblenz in Upper Pomerania, Vorpommern). He was also a Magister of Philosophy, and from 1774 employed as a professor of physics and mathematics at the academic Gymnasium in Stettin. The biographical dictionary also lists him as a poet in Latin (*lateinischer Dichter*). The French title page confirms that Meyen uses the term "economics" as it was normally still used at the time, as "agricultural economics". But it is clear that the treatise goes beyond that, covering both manufacturing and what the German economist Justi earlier in the 1750s had termed *Polizei-Wissenschaft*, or "the science of economic policy".

The practical use of the sciences – the subject of the 1769 essay – clearly was close to Meyen's heart. This urge for usefulness and praxisnahe – for closeness to the practice of real life – is typical both of the German philosophers of this period, Leibniz and Christian Wolff, and also of the later reaction of German economics to the more abstract English school of economics. Almost ten years after publishing the book – from November 1787 to March 1788 – Meyen issued a mathematical monthly under the title, *Unknown and Too Little Known Truths of Mathematics, Physics and Philosophy and Their Use for the Common Good, Particularly for the Economy of Pomerania and Neighbouring Provinces*.

Meyen's book is significant because it so consciously – and early in the process – discusses the epochal shift from a purely qualitative perception of economic reality to one also including quantification. At the time of Meyen's writing, very few uses of mathematics had been made in economics, perhaps only three[3]. François Forbonnais (1722-1800) uses mathematical reasons and symbols in his *Elémens du Commerce* from 1754. Cesare Beccaria (1735-1793), a Milanese economist, used mathematics in the early and mid-1760s. Proposing a metric system for measurements, based on astronomical magnitudes and physical properties, Beccaria clearly qualifies in the category of scientists that

Meyen describes as *Messkünstler* (“artists of measuring”). A third mathematical contribution in economics before Meyen was by Giammaria Ortes (1713-1790) – a Venetian monk – in his *Calcolo Sopra il Valore delle Opinione Umane* (1757).

It is worth noticing that two of these early “artists of measuring” in economics – Beccaria and Ortes – were the first harbingers of Malthus’ theory of population. The qualitative and knowledge-focused economics of the Renaissance had produced optimistic theories like those of Bacon. In this setting, economic development was dependent on scale and a big market, and consequently a large population was seen as a blessing for a nation. Later quantification and abstract economic reasoning tended to hold the level of human knowledge constant, while disregarding the relationship between scale and technical change. This combination of mechanics and statics came to produce what Carlyle dubbed “the dismal science”. Meyen, however, is optimistic. He typically stresses the importance of a large population in order for a nation to achieve wealth.

Meyen (1770) intensely discusses the relationship between theory and practice, and clearly pronounces himself in favour of the *combination* of both theory and practice: “The theoretical truths are reached on a long and barren road, the practical ones on a lighter and fertile one. But the fact that one reaches further on the first road comes from the use that the human spirit makes of both”. Meyen clearly admires the rise of the theoretical sciences: “The theoretical sciences rise faster and to higher levels of perfection than the practical ones”, commenting on “The propensity of mankind towards ‘synthetic’ knowledge or ‘way of learning’ (*synthetischer Lehrart*)”.

The Bible tells us that God “hast ordered all things by measure and number and weight” (*Wisdom of Solomon* 11:20). Not until the thirteenth century, however, did Western civilisation pay much attention to the concept of reality as quantifiable (see Crosby, 1997). Meyen refers to scientists as “measuring artists and persons who understand nature” (*Messkünstler und Naturkundige*), and he clearly uses the term mathematics also to cover measuring and quantification. We are here touching on two phenomena – quantification and the use of mathematics – which occur parallel in history, but which are in fact separate phenomena. From the late Middle Ages onwards one could witness a growing interest in measurement of the surrounding reality (Crosby, 1997). Maps and clocks are two main symbols of this quest for measurement. The Enlightenment saw a related development into a more mechanised world picture, where the emergence of astronomy as a science and of clocks, cogs and wheels, slowly led to a “mechanisation” of the world picture (Dijksterhuis, 1986). It was the mindset from these sciences that later came to influence economics. Adam Smith’s metaphor of “the invisible hand” appears several times in his early publication on astronomy, but only once in the *Wealth of Nations*.

Meyen’s book was published at a time when Justi dominated the *Policey-Wissenschaft*, or science of economic policy, in Germany. Leibniz and Wolff – both referred to by Meyen – were the two prominent philosophers of the time. Meyen also refers to the great agricultural economist of the eighteenth century, Arthur Young. This in spite of the fact that Young was only 27 years old when

Meyen's book appeared. Young's *The Farmer's Letters to the People of England* had been published in 1767. All in all we find Meyen representing the *zeitgeist* of his time, a *zeitgeist* that later found its best expression in James Steuart's *Inquiry into the Principles of Political Economy* (Stueart, 1767). Steuart had spent many years in Germany, and his work was much inspired by German economics, and almost immediately there were two different German translations of his voluminous tomes. At this time quantification was still coupled with the dynamic and knowledge-focused view of Francis Bacon.

Meyen on the relationship between agriculture and manufacturing

Meyen, Young, Hume and Steuart had one very important conviction in common, a conviction which in English political economy was to disappear with Adam Smith. This regards the relationship between agriculture and industry. These authors believed, as David Hume put it in his six-volume *History of England*, that the best way to promote agriculture is to promote industry. Also Meyen insists that manufacturing is the key to national improvement, and he puts it very clearly: "it is known that a primitive people (*ein rohes Volk*) does not improve their customs and habits (*Sitten*) later to find useful industries (*Gewerbe*), but the other way around . . ." (Meyen, 1770, p. 11, emphasis added).

This is the same argument that Mathew Carey highly successfully uses in 1821 in his influential *Address to the Farmers of the United States*, and which Friedrich List uses against English political economy 20 years later. These publications were both important foundations for nineteenth century economic policy. The theoretical argument, however, is seemingly one by the other side, when, in 1846, England convinces the world to stop protecting manufacturing industry because she herself stopped protecting agriculture. However, both Germany and the United States were to follow the advice of Friedrich List, not opening up for world free trade until they had acquired a sufficiently strong industrial base.

It is all too well known that early economists were aware of the importance of money and species. This also led to an awareness of the importance of velocity of circulation. Meyen recognises the connection between the existence of manufacturing industry and a high velocity of circulation ("*Der Flor des Fabrikenwesens giebt nun dem Gelde den vortrefflichsten Umlauf*" (p. 143)).

The pre-Smithian argument against opening a nation to free trade too early was that economic progress was activity-specific, it was tied to certain economic activities which were the carriers of technology to other economic activities. Here Meyen's statement is very clear (see also Meyen, 1770, p. 150). This argument was lost in the mechanised world view of neo-classical economics. In this context the great novelty of Adam Smith was that he – for the first time – made all economic activities qualitatively alike as carriers of economic progress. The importance of this historical controversy for today's economic policy in the Second and Third Worlds cannot be overemphasised (see Reinert, 1999).

Meyen on technology, science and innovations

The general opinion among economic historians is that the first industrial revolution did not have close ties to science. One could, however, argue that this may have been less true in Germany than in England. Meyen was clearly aware of the important role of science in promoting the wealth of nations. A few years after Meyen published his price essay, Johann Beckmann, who was a professor of economics in Göttingen, wrote a book about the role of technology in economics (Beckman, 1780). Also in the 1770s, Goethe's friend Johann Gottfried Herder discusses science policy in a book entitled *On the Influence of Government on the Sciences, and that of the Sciences on Government* (Herder, 1781). In England Charles Babbage raises this same argument in the 1820s (Babbage, 1830).

Innovation is an important subject in English political economy from Francis Bacon's *An Essay on Innovations* (around 1605) to James Stueart's 1767 book. The term innovation is repeatedly used by Stueart, but disappears in the trade-and-barter focused theory of Adam Smith. Meyen belongs to the old school, and stresses the practical goals of the great German philosophers of the day. Their science is not empty like scholasticism, their goals are practical: "Leibniz took great care to improve the machinery used in mining, and the archives of Hanover still contains piles of documents regarding these matters. Wolff introduced suggestions to the propagation of corn, and informed the world thereof – but these improvements are not appreciated" (Meyen, 1770, p. 20).

Meyen on resistance to change

The common people's lack of appreciation of improvements is a recurrent theme in Meyen's book. He often complains of a "hatred against reason" – *Hass gegen den Verstand* – which prevents new discoveries from being put into practical use. Here is one example: "Many nobles of Pomerania and Rügen have properties in Schonen (Skåne, Sweden), where 7 or 8 horses are used to plough, and with a horseman on every horse". Clearly this was a very inefficient and labour intensive way of ploughing. Better harnesses were sent from Pomerania, but alas, the "improvers" were driven away with showers of stones.

Meyen then lists the reasons why practical people do not learn from theoretical knowledge: they are pride (*Hochmut/Stolz*), meanness (*Geiz*), and also because people are simple-minded (*einfältig*), lazy (*faul*), and envious (*neidisch*). We find the same issue addressed by Christian Wolff when he suggests that "It ought to be prohibited to make mockery with inventors" (see Reinert and Daastøl, 1997).

Meyen complains that the normal excuse used to block innovations is the phrase "That may be true in theory, but not in practice". Obviously having heard this excuse over and over, Meyen also repeats it over and over in his book. He also observes that innovators and improvers (*Verbesserer*) fall victim to ostracism ("*Ostracismus*"). Socrates is Meyen's prime example of the "improver" (*Verbesserer*) who is driven away. Meyen describes a world of ignorance in which a sort of "Gresham's Law" drives out good practice and protects old bad practices. Meyen is here very much in line with his ruler, Frederick the Great of

Prussia, who describes the “liberation from above”, the kind of governmental stimuli which were typical of the premodern age: “The plebs” – his term for the rising bourgeoisie – “will never give up the humdrum tune, unless you drag them by their noses and ears to their profits” (quoted in Cowe, 1988).

In Meyen’s opinion revolutions are required in order to improve things: “The discoveries were a fruit of genius, and were normally already around for a long time, but the introduction and feasibility of the improvement came out of the revolutions” (p. 19). In Keynes’ world, practical men are all slaves of defunct economists. In Meyen’s world practical men were slaves of old habits.

Meyen on “synergies”

Early economists were aware of what we would call synergies between economic activities. In 1613 Antonio Serra says that the wealth of a city can be roughly judged by counting the number of different professions: the larger the number of professions, the wealthier the city. In other words, the greater the division of labour, the greater the wealth (Serra, 1613).

Meyen describes the usefulness of what we would call networks: “A nation is happy when the theoreticians and the economists are in constant activity and in connection, and are aware of the advantages that these sciences may bring to every economic activity (*Gewerbe*) in the nation” (Meyen, 1770, p. 14).

Meyen stresses that “lines of communication” from one science to another bring advantages. Here he uses as one example that artillery and fortifications have achieved several advantages from higher geometry. Meyen also has a clear description of a type of accidental discovery that we would call serendipity (Meyen, 1770, p. 15).

Meyen on types of nations

Meyen produces a typology of nations (1770, pp. 48-9), and argues that national characteristics are important in order to explain to what extent sciences will be put to practical use: “In this way (i.e. through the typology) one can investigate to what extent a nation will tend to connect the theoretical sciences with economics, or what kind of hindrances are in the way of such connections”.

Meyen distinguishes between three types of nations:

- (1) *When a nation has the character of a soldier . . .* sciences will not be held in high esteem. In such a nation the scientists will also try to tyrannise his profession (*Dort wird auch fast ein jeder schlechter Mensch monosyllabisch genug sein, und in seinem Fache tyrannisiren suchen*). Here mathematics will also be little used in the art of war, because empiricism is used “they will use the contributions from the sable rather than those from mathematics”.
- (2) *When a nation has the character of a trader* (Kaufmann), everything that regards trade will have good conditions. But as soon as the scientist raises above what causes domestic advantages, like the reduction of imports, he will face the usual problems. The (agricultural) economist

will be hated in the nations where the traders are at the steering wheel, and the farmer gets very little respect beyond what respect he gets from producing staples, “Though, the *Teoreticus* has an advantage in this type of nation: the measuring artist (*Messkünstler*) can help shipbuilding and the improvement of machinery (*Maschinen Wesen*)”.

- (3) *When a nation is similar to a woman . . . the belle arti*, the poet, the writer of novels, the actor, and the producer of jewellery will find applause. But the agricultural economist will have to be a simple farmer. Mathematics and physics have the worst conditions in such states. The producer finds his inventions from the neighbour, and these are brought to him by the merchant of fashion accessories. Art itself, and even more theoretical sciences, are muted. This is because this kind of nation only considers the beauty of an article.

To Meyen the prospects for science are rather bleak in most, if not all, countries. However, during the next century Germany was to produce a new type of nation, where science was held in higher esteem than probably in any nation, before or after. Germany became a type of nation described by an English foreign minister as “A nation of bloody university professors”.

Conclusion: history as the way out of scholasticism

Meyen’s economics, while arguing for quantification and mathematisation, still stresses the importance of the non-quantifiable issues like knowledge, science, networks and “national character”. In the 1750s a scientific trajectory of “theory with measurement” begins, which now slowly has degenerated to “theory without measurement”.

As already mentioned, the affiliation of neo-classical economics with the pedantic and circuitous reasonings of scholasticism is not new. It is in this spirit that the Danish economist L.V. Birck already in 1926 named an article discussing the theories of Böhm-Bawerk “Moderne Scholastik” (Birck, 1926). Like neo-classical economics, in its extreme form scholasticism also “proves” things that contradict common sense and intuition. McCloskey (1985) makes this point very well.

Francis Bacon gave us the formula for escaping scholasticism, a formula that in our opinion is the solution also for today’s problems in economics:

Martin Luther, conducted no doubt by an higher providence, but in discourse of reason, finding what a province he had undertaken against the bishop of Rome, and the degenerate traditions of the church, and finding his own solitude being no ways aided by the opinion of his own time, was enforced to awake all antiquity, and to call former times into his succour, to make a party against the present time. So that the ancient authors, both in divinity and in humanity, which had long slept in their libraries, began generally to be read and revolved (Bacon, 1605).

In 1886 Columbian economist Edwin Seligman described how economics in the 1850s freed itself from the claws of Ricardian irrelevance. Seligman’s prescription was the same as that of Bacon 300 years earlier: go back to history

as the only laboratory we have. He explains the re-development of the alternative economic canon, a reply to the *reductio ad absurdum* of orthodox Ricardian economics:

The socialists, such as Weitling, Marlo and Proudhon, uttered energetic and effective protests against the prevailing systems; and in England able men like Thompson and Jones wrote large works to countervail the exaggerations of the orthodox school. But the new ideas first obtained a truly scientific basis about the middle of the century, when three young German economists – Roscher, Knies and Hildebrand – proclaimed the necessity of treating economics from the historical standpoint. They initiated a new movement whose leading principles may be thus formulated:

1. It discards the exclusive use of the deductive method, and stresses the necessity of historical and statistical treatment.
2. It denies the existence of immutable natural laws in economics, calling attention to the interdependence of theories and institutions, and showing that different epochs or countries require different systems.
3. It disclaims belief in the beneficence of the absolute laissez-faire system; it maintains the close interrelation of law, ethics, and economics; and it refuses to acknowledge the adequacy of a scientific explanation, based the assumption of self-interest as the sole regulator of economic action (Seligman, 1925).

In our opinion this is the path which again has to be followed in order to lead economics out of the barren wastelands of scholasticism. Hopefully this note has illustrated that today's economic scholasticism has not been caused by mathematics *per se*. As Meyen's book shows, the introduction of science, quantification and mathematics in economics was indeed a most useful innovation. The analogy with Bacon's criticism of the schoolmen shows us that mathematics is but one language in which a science may decay to sterility and irrelevance.

Notes

1. Birck (1926) heads the article with Carlyle's motto as already quoted in this article: "That dismal science!".
2. Bibliographical information from *Allgemeine Deutsche Biographie*, Vol. 21, p. 553.
3. These early contributions are discussed in Theocharis (1983).

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