

On the Educational Missions of Philosophy

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One of the most important issues concerning the organization of research and higher education concerns their interaction. The most common form that this relationship of research and education takes in our time and age is to have both functions combined in universities, often referred to more specifically as research universities. This form of organization is more recent than one perhaps might first think, and even at this time there are exceptions to this form of organization. In natural sciences and medicine there are industrial laboratories for research without teaching. In some countries, especially in Russia, there exists an extensive hierarchical institution almost entirely dedicated to research rather than teaching, called an academy of sciences. The members of such academies can devote themselves entirely to research without any teaching duties, except perhaps on the level of dissertation advising. Other exceptions include some rare graduate or research institutions, for instance Rockefeller University, All Souls College, Oxford, and some institutes of advanced study. But such exceptions are few and far between, at least in Western Europe and the Americas. Thus by far the most common relationship, especially in the humanities, of research and teaching is to have them conducted by the same people at the same institution, usually called a university.

What are the reasons for this system? And do these reasons justify it? These questions are made urgent by the unmistakable tension that exists between the two functions of universities, both within them and in their relation to the outside world. Most of the quantifiable work that faculty members do is teaching, and yet they are typically hired, promoted, or turned down for tenure on the basis of their research record. Governments and legislatures often consider the educational function of universities the predominant ones, while prominence in scholarship and purely theoretical research has only marginal prestige value. The question of the relation of scholarship and research to education at universities is hence worth a closer look.

This question can be approached in many different ways. I will restrict my attention here to one particularly important aspect of the subject. It is the claim that research and scholarship, including their results, can enrich the teaching mission of universities. By such possible improvement, I do not mean the effects of doing research on the teaching performance of individual faculty members, but the concrete insights that scholarship and research can reach as to what is worth teaching, why, and how. In other words, I do not mean improvements in teaching performance as much as improvements in the curricula. To take an example from a non-humanistic field, why in the sixties was the teaching of mathematics from kindergarten on supposed to follow the principles of the so-called 'New Math' and be based on set theory? The New Math was not marketed as a pedagogical novelty, but as being based on research into the nature of mathematics.

Here I will restrict myself to my own field, philosophy. What are the most important missions of philosophy as far as general education is concerned? I do not expect too much controversy about the answer, at least not if we discount the misuses of philosophy in the service of ideologies and religions. The most important aims of instruction in philosophy include (but are not exhausted by), first, the teaching of the skills of reasoning and argumentation, and, secondly, the teaching of the history of thought in such a way that it helps the students to find their intellectual bearings better in the world they live in. Needless to say, both these skills are invaluable to good citizens and good members of the community of human beings. I will discuss these two missions of philosophy one by one.

How can you teach reasoning and argumentation? In the bad old days, the answer was to teach traditional so-called Aristotelian logic. The tremendous progress of research in logic itself in the last century and a half has shown the inadequacy of this logic, however. After World War II, modern 'symbolic' logic became a staple of philosophy curricula. But the logic instructors gradually found that teaching quantification theory or set theory did not automatically make students reason or argue better. As a reaction, in the United States there arose a couple of decades ago organized movements with names containing such phrases as 'reasoning and critical thinking' and 'informal logic'. They claim to be based on research into actual human reasoning, but unfortunately I have to report that there obtains by this time a nearly total alienation between these movements and all genuine research into the nature of logic and reasoning. 'Informal logicians' have no grasp of what is going on in real research in logic, and research logicians look down on dedicated logic teachers instead of helping them.

Is this state of affairs a catastrophe? The answer is not obvious at first. Reasoning and argumentation can be taught, and taught successfully, without a formal apparatus by repeated exercises, example, and detailed personal guidance. The tutorial system in Oxford University is a live example. I have myself witnessed successful teaching of reasoning and critical thinking that was genuinely beneficial to students. But such a teaching method relies on the skills of individual instructors and above all is incredibly labour-intensive, and therefore inapplicable in the contemporary world where the number of university and college students has grown and is growing universally. In such circumstances, only the most gifted and dedicated teachers can succeed. Those who are not naturally excellent teachers and excellent reasoners cannot find means of teaching themselves and teaching future teachers to do their job well.

As a consequence, instructors need clear systematic guidelines of what to teach in courses of reasoning and argumentation and how to do it, at least in the sense of what to aim at. And in this respect, research logicians and philosophers of logic have in my judgment neglected to develop theories and methods which would be of use in teaching.

This may sound very abstract, so let me spell out my point. With some amount of benign oversimplification, one can say that the same thing has happened to logic teaching as has happened to ethics. Philosophical ethics began in ancient Greece as a study of moral and more generally social excellence. The different virtues were different kinds of excellence, and a virtuous man was literally a virtuoso performer of the stage of communal life. But a funny – or, rather, sad – thing happened on the way to contemporary morality. Ethics has become, not a study of moral excellence, but a study of how to avoid moral mistakes: in an extreme case, how to preserve one's 'virtue' in the euphemistic Victorian sense of preserving one's virginity. As far as contemporary society is concerned,

I am prepared to conjecture that when you hear the phrase 'business ethics' what it evokes is likelier to be an exposure of sundry business malpractices than the definition of an ideal executive.

Mutatis mutandis, the same thing has happened to the teaching of logic. Logic was initially a study of excellence in reasoning, but it has become on the level of introductory logic teaching merely a study of how to avoid mistakes in logic, not to say how to preserve one's logical virtue. How literally this is true can be seen by reflecting on the nature of what are nowadays called 'rules of inference'. In introductory logic courses most of the time is devoted to familiarizing students with them. But what do these 'rules of inference' do? Suppose I have twenty potential premises available to me. Do the rules of inference tell me what to do, that is, which of these propositions I should use as a premise for my next inference? No, all they do is to tell me which inferences I *may* draw. They are merely permissive, rules for avoiding fallacies. They do not tell how people in fact do reason, nor how they ought to reason. They are neither descriptive nor prescriptive.

Even more generally speaking, contemporary textbooks of logic, reasoning, and argumentation are characterized by a striking sense of insecurity. The discussion of fallacies plays a disproportionate role in them. Illustrative of this insecurity is the title of a text that I once received from its publisher: *Logic, The Art of Verbal Self-defense*. It is understandable that those philosophers and mathematicians who are concerned with the stringency of reasoning should pay close attention to what is and is not permissible in reasoning, and the same goes for lawyers and their reasoning. But when such preoccupation becomes exclusive, we are no longer concerned with excellence in reasoning.

Furthermore, typical logic texts operate with the simplest possible methods of proof, not the most efficient ones. All this has made typical texts in logic, reasoning, and argumentation woefully inefficient guides to efficient reasoning. And this situation can be blamed precisely on a failure to bring actual research in logical theory to bear on the teaching of logic as a part of students' general education.

In the study of reasoning outside deductive logic, which is the province of epistemology, the same insecurity and timidity is manifested in the often-repeated claim that we can only deal rationally with the verification and confirmation of theories and other important types of knowledge, not with the way they are discovered. In the form of a slogan, there can be a logic of confirmation, but not a logic of discovery. It seems to follow that you can only teach students to show that they are right, but not to discover new truths.

Does this mean that the main rationale for combining research and teaching is mistaken? It does not, for there are excellent, albeit unused, possibilities for research in logic and epistemology to enrich the curricula of courses in reasoning and argumentation. It is only possible for me here to indicate some of the main ideas. First, we have to make a distinction between two kinds of rules in any goal-oriented activity like reasoning. Such activities can be usefully conceptualized along the lines used to analyze games. Now, in any game-like process we can distinguish two kinds of rules, called *definitory* and *strategic* rules. The *definitory* rules tell us what may happen in a game. For instance, the *definitory* rules of chess specify how chessmen may be moved on the board, what counts as checking and checkmating, and so on. But if you only know the *definitory* rules of chess, you cannot even claim that you know how to play chess. No real chess buff would deign to play against you. For that purpose, you must have some grasp of the *strategic* rules of chess, that is, some grasp of which sequences of moves are likely to be successful, how

you should respond to different kinds of moves of your opponent, and so on. Such strategic rules do not have to be merely heuristic. They can be studied with as stringent methods as definitory rules, albeit that in the most interesting cases, the optional strategic rules cannot be mechanical, that is, computable by an idealized digital computer (Turing machine).

What is wrong in concentrating on the so-called rules of inference in logic teaching is that they are definitory rules of the 'game' of logic, not its strategic rules. Such definitory rules may be supplemented by strategic rules and, more importantly, understanding good strategies should be the aim of logic teaching and the mastery of the so-called rules of inference should be only a means to that end.

Similar things can be said of empirical (ampliative) reasoning. Borrowing a clue from good old Socrates, such reasoning can be treated as a questioning process with its own definitory rules and strategic rules. Admittedly, neither in logic nor in interrogative inquiry are the best strategic rules computable in general, but that does not make it impossible to identify factors that are useful to keep in mind in reasoning. One of the most important insights here is that a typical nontrivial argument does not succeed unless new objects (sometimes including new functions) are introduced into the argument.

This may sound very abstract, so an example is in order. Where can we find better examples of clever reasoning than in Sherlock Holmes's exploits? One of the most famous of his 'deductions' is recounted in the story 'The Silver Blaze'. The famous racing horse with that name has been stolen from the stables and has disappeared. In the morning, the trainer of the horse, the stable master, is found outside, killed by a mighty blow. Several different characters are under suspicion, and the police are puzzled until the good inspector asks Holmes whether he thinks there is some aspect of the case to which he wants to draw the attention of the police. 'To the curious incident of the dog in night-time.' 'But the dog did not do anything.' 'That is the curious incident.'

What is the famous sleuth doing here? He is asking three questions: was there a watchdog in the stables during the fateful night? Yes, we already know that there was. Did the dog bark? No, it did not even wake up the stable-boys in the loft. Now who could take the horse out in the middle of the night without the trained watchdog barking? Its trainer, the stable-master, of course. Hence it was the slain stable-master who stole the horse . . . 'Elementary, my dear Watson,' Holmes used to say. But what is not elementary is the question of what makes Holmes's reasoning nontrivial. The police had been concerned with the principals of the case: the stolen horse, the unknown thief, the slain stable-master, and the unknown killer, and they had made no progress. What Holmes does is to introduce a new object into the situation, the dog. And as soon as he starts to ask questions about the dog's relation to the principals, new insights are immediately achieved literally in the same way as the right auxiliary constructions in Euclid can make the truth of a geometrical theorem obvious.

Moreover, the insights we can thus reach into the strategies of reasoning are not only informal. We can for instance compare the strategy choices in deduction and in interrogative reasoning. These two are substantially speaking entirely different activities, and in neither one are the best strategies computable. However, if we restrict our attention to only such interrogative reasoning as it aims at discovery, the two can be seen to be parallel, strategically speaking, in the sense that the optimal choices of moves are parallel. Thus a logic of discovery is not only possible. It turns out to be the same as deductive logic,

strategically speaking. Hence Sherlock Holmes was right, so to speak, when he spoke of all good reasoning as so many 'deductions' or 'inferences'.

I trust that this convinces you that the results of logical research can be highly relevant to the skills of good reasoning in general. My purpose here is nevertheless not to extol the virtues of logic in general education, but to relate it to the issue of the division of labour – or, rather, to the purported integration of labour – in higher education. The prevailing rationale turns out to be right in this paradigm case. Theoretical research is in a position to enrich what I consider to be the most important educational mission of philosophy, the teaching of reasoning and argumentation. But at the same time, these opportunities are being missed in the actual day-to-day operation of colleges and universities. It is a disconcerting fact that while more logic courses are given in departments of philosophy than in any other departments, most of the cutting-edge research in logic is done in other departments. We are here facing a major challenge not only to the philosophical community but to the administrators of all institutes of higher learning.

I believe that similar things can be said of the role of philosophy, including history of philosophy, in helping students to form an educated *Weltanschauung*. I firmly believe in Santayana's dictum according to which the punishment for not knowing the past is to have to repeat it. But unfortunately there are so many other legitimate ways of approaching the history of thought that those aspects that would be most useful for students get easily buried under the others. One temptation philosophers in particular are subject to in dealing with earlier thinkers in their teaching is to use them and their views as little more than a foil for discussing what they take to be the perennial questions of philosophy. A colleague of mine once commented on a graduate student defending a dissertation on ancient Greek philosophy: 'He is forgetting that there existed philosophers between Plato and Frege.' A related pitfall is simply to project our current problems and doctrines back to history. This is sometimes motivated, but it often leads to anachronisms. I have shown myself that even the current form of basic logic, known as first-order logic or predicate logic, embodies assumptions that were not accepted by any philosophers before the nineteenth century, prominently including the claim that verbs for being like the English 'is' are ambiguous between the notions of identity, predication, existence, and subsumption. Yet this logic is commonly used as an interpretational framework also in the earlier history of philosophy.

Other temptations include turning the history of philosophy into a minute scholarly examination of the fine points of different thinkers' work. This temptation is not new, but it is still very much among us, even though it is a while since I heard anyone speaking of *Kant-Philologie*. Of course, such scholarly work is worthwhile and it provides an inescapable basis for more sweeping kinds of investigations. But it does not help a philosopher to guide his or her students to an understanding of their contemporary situation.

The opposite approach is in terms of sweeping generalizations about different -isms, paradigms, normal and crisis science, and so on. Again, this may be interesting, but it is useless for educational purposes. What use is it to tell a student – or anybody else, for that matter – that we are always prisoners of this or that 'paradigm' when what one is trying to become aware of is one's own paradigm and of its limitations?

Such approaches are often combined with an emphasis on the determinants of human thought, including philosophical thought, in its historical, sociological, and psychological context. Again, I consider such research potentially important, but primarily in so far as it

helps to uncover the presuppositions that threaten to limit our own thought. What we ought to try to convey to our students is the ability to recognize assumptions and presuppositions in other people's argumentation and in their own. Historical studies can serve as a teaching ground for this purpose, but only if they can provide successful examples of such a critical analysis – and synthesis.

Again, I am dissatisfied with the present situation, but optimistic as to what can be done in this direction. Perhaps I may illustrate what I have said by reference to one important example. Unfortunately, because of limitations of time, I have to be much more sketchy and dogmatic than the subject matter deserves.

There is scarcely any episode in the history of human thought that has been put to more ideological uses, and to more diverse uses, than the condemnation of Galileo Galilei by the Inquisition in 1633. This episode has been interpreted in the most varied ways. Was the Church trying to suppress scientific truth? Scarcely, for Galileo had been encouraged by members of the Church up to and including Cardinal Bellarmine. Was the Church worried about the Copernican system, that *prima facie* seems to contradict the Bible? There was in fact considerable worry, but not so much about detailed astronomical research as about its reception by the general public. It was even permissible to teach the Copernican system, as long as it was presented as one possible hypothesis calculated to 'save the phenomena'. Was Galileo misunderstanding the epistemology in science in presenting his views as established truths, not merely as hypotheses? Does not the generally accepted hypothetico-deductive model of science amount to just that? Furthermore, Galileo's political and social circumstances have been examined *ad nauseum*. Thus the fate of Galileo does not seem to help anyone to orient in the maze of issues involved in this alleged conflict between science and religion. There nevertheless is a way of looking at Galileo's real 'crime' that shows the questions that were really at issue in his thinking – and in the thinking of his persecutors. The Galileo affair is connected with one of the most fundamental developments of human thought, namely the gradual disassociation between conceptual or logical necessity and natural or physical possibility. This disassociation is necessary for the development of the notion of a mathematical law of nature. For as soon as a law of nature is expressed mathematically, other mathematical laws become thinkable and hence logically possible. Hence no mathematically expressible law of nature is logically necessary. What Galileo was trying to do was to find out what the laws of nature are that in fact govern the world. He was not claiming that they were necessary in the logical sense of the word.

Now there is nothing heretical in such an enterprise. Some of the subtlest medieval thinkers, first and foremost the 'doctor subtilis' Duns Scotus, had before Galileo reached the distinction between the different kinds of necessity without seeing anything in it that contradicts faith or the Bible. Unfortunately for Galileo, the grey eminence of his case, Cardinal Bellarmine had not found his way to the distinction. Moreover, Bellarmine combined this assimilation of the different senses of necessity and possibility to each other with a metaphysical assumption which ultimately also goes back to Aristotle. He believed that God in his infinite generosity had realized all possibilities. Because of the assimilation, this realization of all possibilities included all logical possibilities, that is, all conceivable possibilities. Now these logical possibilities include, as we saw, exceptions to mathematical laws of nature. Hence these laws cannot be exceptionless, Bellarmine believed. Therefore, by claiming that there are exceptionless laws of nature, Galileo had in Bellarmine's view

claimed that these laws are logically necessary and hence binding even to God. This is what is meant by the crucial phrase of the condemnation, namely by the accusation that Galileo had tried to limit God's possibilities.

Thus Galileo deserves his place in the history of human thought after all. He turns out to have been a defender of the central ideas of the scientific revolution. His condemnation was not a result of political intrigues or petty quarrels. He was not transgressing the methodological boundaries of empirical science, even. At issue was the very possibility of natural science as we know it, in the form of the possibility of empirically established, mathematically expressible laws of nature.

The other side of the ledger is that there is nothing in non-fundamentalist Christian religion that is in conflict with the modern conception of laws of nature. What it was in conflict with is Bellarmine's belief in the metaphysical principle, sometimes called the principle of plenitude, that says that all possibilities are realized, jointly with the prevailing confusion of logical and natural necessity. Of course, in Bellarmine's thinking, this assumption was motivated by theological ideas about God's omnipotence, pure actuality, and generosity, but it was codified in a metaphysical principle which was not by any stretch of the imagination a part of the Christian faith. Hence what prompted Galileo's case was not a transgression of science into metaphysics or into theology; it was a certain theologian's attempt to legislate on metaphysical grounds what science can and cannot do.

I cannot argue fully for this perspective on Galileo here. It was in any case precisely how the best informed observer of the Galileo case understood it. The name of this observer is Gottfried Wilhelm Leibniz. One of his philosophical aims was to reconcile the idea of lawlikeness with the idea of freedom and with the rest of the central tenets of religion. Even on the mundane diplomatic level, Leibniz endeavored to have Galileo's works removed from the Index. But even if we do not immediately accept my interpretation as a historical truth, you can still understand without further explanations the morals of this possible Galilean story for one's outlook on the relations of science and religion. You can likewise appreciate the hold of philosophical ideas (like the principle of plenitude) on people's thinking. Hence, this case study will vividly illustrate my point of how the results of historical research can help all of us, including our students, to find our bearings in the ideological jungle of today. And if you think that this particular example has only antiquarian interest, please recall that Galileo was officially exonerated by the Church just a few years ago.

To return to my central theme, the teaching of the history of philosophy can thus greatly help instructors, curriculum designers, and text book writers. But, again, these possibilities are not being utilized in educational practice in the way they should be. What consequences these results have for the organization of higher education and higher research, I will leave for you to decide. This question is perhaps closer to actual realities than you might at first suspect.

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Bibliography

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