Abstract

Some general, programmatic points about informal logic are addressed. The informal approach to argument analysis faces serious foundational problems which have been recognized by its practitioners – informal logic has yet to come together as a clearly defined discipline. Another problem is the dilemma of the dialectician (Sextus Empiricus): informal logic is either trivial or powerless on its own (field expertise is needed). According to Johnson and Blair the central notion in theory of argument is cogency which replaces soundness. An argument is cogent if and only if (i) its premises are rationally acceptable, (ii) its premises are relevant to its conclusion and (iii) its premises provide sufficient reason to accept the conclusion. I propose to understand cogency as a broader notion that includes deductively valid inferences. The criteria of cogency are simply the basic ideals of scientific methodology which requires a respect for available evidence and “reasonable” inference, an awareness of alternatives and a willingness to modify or reject those beliefs that fail to conform to the evidence. Informal logic in the sense of elementary scientific methodology is concerned with proper reasoning and not with proper dialogue. Informal logic involves non-trivial argumentative skills and abilities applied to the subject area and accessible to every normally intelligent and educated person.

Keywords: informal logic, argument, cogency, scientific methodology, everyday reasoning

1. I would like to address some general, programmatic points relating to so-called informal logic. My reflections on this issue were provoked, initially, by the practice of teaching logic to undergraduate students of philosophy. Contemporary formal logic offers a well worked out theory; the problem is simply how to make it relevant to philosophical or even everyday reasoning. (According to B. Russell’s ironic remark, strict proofs are to be found in mathematics and theology only, so at least some philosophical relevance of formal logic is guaranteed …). Nowadays, everyday reasoning is more appropriately studied in courses of informal logic and critical thinking. The core notion is usually the notion of the argument and questions such as: What distinguishes good from bad arguments? What makes a good argument succeed? What makes a bad argument fail? It seems sensible to teach elementary “informal” reasoning skills and perhaps combine classes of standard formal logic with classes which outline various non-formal techniques of argument analysis.

Now, by the end of a typical “combined” course almost all of the students will have mastered the required symbolic manipulations (natural deduction, axiomatic proofs). However, when required to informally analyse a piece of “ordinary” reasoning many of them fail badly. Elementary logical “calculi” are apparently much easier to master than the techniques of applied logic. What then should we do with informal logic? What should we teach and how should we test the results? (Mis)achievements are difficult to evaluate – is failure to be
explained by lack of knowledge in some specific field of everyday argumentation (not something to be taught in the logic class) or by lack of some special logical knowledge (something one should master in the logic class)? Are there any special skills of informal logic at all? Is it all just a matter of general intelligence and the depth of one’s knowledge?

Peter Medawer, a Nobel laureate in medicine, gave the following comment on scientific method and philosophy of science in general: “If the purpose of scientific methodology is to prescribe or expound a system of enquiry or even a code of practice for scientific behaviour, then scientists seem to be able to get on very well without it. Most scientists receive no tuition in scientific method, but those who have been instructed perform no better as scientists than those who have not. Of what other branch of learning can it be said that it gives its proficients no advantage; that it need not be taught or, if taught, need not be learned?” (Medawar, 1969: 8). Well, informal logic sprang naturally to my mind. Not surprisingly – informal logic, or logic in a broad sense, is basically just elementary scientific methodology, or so I will argue. Medawer also added: “Of course, the fact that scientists do not consciously practice a formal methodology is very poor evidence that no such methodology exists” (Medawar 1969:9). So, all hope for a more theoretical approach is not lost.

Informal logic, variously called the logic of “real” arguments, the study of the practice of argumentation, critical thinking, argumentation theory, theory of practical reasoning, applied logic . . . , is a blooming field of theoretical and practical activity. In their survey article (2002) Johnson and Blair describe informal logic as (a) the theory of fallacies and (b) the theory of (actual, natural) arguments. There is a strong tendency to associate informal with anti-formal. The growing disenchantment with the capacity of formal logic to set the standards of good reasoning has led to informal logic being described as any approach in logic which either avoids or minimizes the use of formal logic as the theory of analysis (the notion of logical form) and as the theory of evaluation (the notions of validity and soundness) of arguments. The quotes below illustrate this tendency:

By ‘informal logic’ we mean to designate a branch of logic whose task is to develop non-formal standards, criteria, and procedures for the analysis, interpretation, evaluation, critique and construction of argumentation in everyday discourse (Johnson and Blair, 1977: 148).

… the subject matter of informal logic is different from that of formal logic. Informal logic has the task of developing norms for the evaluation of arguments; formal logic has the task of developing the norms for formally valid implication relations (Johnson and Blair, 2002: 360).

In the emphasis on investigations of natural arguments in their actual settings as opposed to formal techniques of contemporary logic one may detect the remnants of the old divide of the sixties: ideal language vs. ordinary language theorists. Formal plays the role of the "Ugly, Dirty and Bad." Another opposition often found in characterizing the distinction between the two approaches is the one between semantics and pragmatics:

Formal logic has to do with the forms of argument (syntax) and truth values (semantics)... Informal logic (or more broadly, argumentation, as a field) has to do with the uses of argumentation in a context of dialogue, an essentially pragmatic undertaking (Walton 1998: 418-19, quoted by Johnson and Blair, 2002: 362).
From the pragmatic point of view, any particular argument should be seen as being advanced in the context of a particular dialogue setting. Sensitivity to the special features of different contexts of dialogue is a requirement for the reasoned analysis of an argument (Walton, 2008: 2).

To be fair – not all theoreticians subscribe to the view that informal is simply anti-formal. In his survey article on informal logic Hitchcock remarks:

In any case, the research programme of informal logic does not preclude the use of formal methods or appeal to formal logics. Its distinctiveness consists in its consideration of a set of questions that are not addressed in the specialist journals of formal logic, such as the Journal of Symbolic Logic and the Notre Dame Journal of Formal Logic, or in such histories of formal logic as that by William and Martha Kneale (1962). It might in fact better be called “theory of argument.” Its questions have however traditionally been regarded as part of logic, broadly conceived. The name can thus be taken to refer to that part of logic as traditionally conceived that is not covered by contemporary formal logic (Hitchcock, 2006: 101).

I agree with the spirit of this paragraph, although it does not offer much in the way of a definition of informal logic (“that part of logic that is not covered by formal logic”). Problems with the very definition of the discipline should give us cause for concern. According to Walton and Brinton (1997: 9, quoted in Johnson and Blair 2002: 352):

“Informal logic has yet to come together as a clearly defined discipline, one organized around some well-defined and agreed upon systematic techniques that have a definite structure and can be decisively-applied by users.”

In his analysis of the structure of science Kuhn introduced a notion of “pre-science” which, so it seems to me, fits the theoretical situation of informal logic well. Before a scientific discipline develops into “normal” science, there is normally a long period of somewhat inchoate, directionless research into a given subject matter. There are various competing schools, each of which has a fundamentally different conception of what the basic problems of the discipline are and what criteria should be used to evaluate theories about that subject matter. Some disciplines never reach the status of a “normal” science. If we take, now, the Fundamentals of Argumentation Theory (1996) as our guide in the theory of argument, the following approaches are listed: theory of fallacies, new rhetoric, critical thinking, dialogue logic and formal dialectics, pragma-dialectics, theory of dialogue, game theory… A variety of approaches signals foundational problems. What exactly is informal logic? Is it really a branch of logic? Is it, or ought it to be, a distinct discipline? How, if at all, is informal logic to be marked off from neighboring subjects such as critical thinking, dialogue logic, and argumentation theory as a branch of rhetoric?

Some of the problems with the theory of argument were noticed long ago, at the very beginning of the discipline, which was first canonized in Aristotle’s Organon (the theory of fallacies in De Sophisticis Elenchis). Sextus Empiricus in his Outlines of Pyrrhonism presented what I would call the dilemma of the dialectician (mentioned briefly by Walton, 1987: 303):

Perhaps it will not be out of place briefly to consider the topic of sophisms, since those who glorify logic say that it is requisite for explaining them away. Thus, they
say, if logic has the ability to distinguish true from false arguments, and if sophisms are false arguments, logic will be capable of discerning these as they abuse the truth with their apparent plausibilities. Hence, the logicians, pretending to be giving assistance to tottering common sense, try earnestly to give us instruction about the concept, the types, and the solutions of sophisms.

In the case of those sophisms that logic seems particularly capable of refuting, the explanation is useless; while as regards those for which explanation is useful, it is not the logician who would explain them away but rather those in each art (techné) who have got an understanding of the facts (Outlines II: 236; Mates, 1996: 167).

This sounds like Medawer on philosophers of science teaching scientific method! Sextus, a physician himself, gave the following example:

In the abatement stage of disease, a varied diet and wine are to be approved. In every type of disease, abatement occurs before the first three days are up. Therefore, it is necessary for the most part to take a varied diet and wine before the first three days are up. The logician would have nothing to say toward explaining the argument away, useful though such an explanation would be: but the doctor will do so, knowing that “abatement” is ambiguous and refers either to that of the entire disease, or to the tendency to betterment, after crisis, of each particular attack; and knowing also that the abatement of the particular attack occurs for the most part before the first three days are up but that it is not in this abatement but in the abatement of the whole disease that we recommend the varied diet.

Whence he will say that the premises of the argument are incoherent, with one kind of abatement—of the whole disease—taken in the first premise, and another kind—of the particular attack — taken in the second. And thus, in the case of the sophisms that can be usefully explained away, the logician will have nothing to say, but instead he will propound to us such arguments as these: Snow is frozen water. But water is dark in color. Therefore, snow is dark in color. And, when he has gathered together a collection of such nonsense, he knits his brow and takes logic to hand, trying very solemnly to establish for us by means of syllogistic proofs that … snow is white …

If, then, logic fails to explain away such sophisms as might usefully be solved, while in the case of those that somebody might suppose that it does explain, the explanation is useless, then logic is simply of no use in the solution of sophisms (Outlines II: 236; Mates, 1996: 167-68).

We may take “logic” in this text as logic in the broad traditional sense mentioned by Hitchcock, so here is our dilemma: (informal) logic is either trivial (“snow”) or powerless on its own (field expertise is needed). And to follow the lead of Sextus: the analysis of reasoning is either “contentful”, but this is done by experts, or topic neutral. Concentrating on topic neutral reasoning skills will only bring us back to the old and “impractical” formal logic. But learning to reason substantively involves learning about actual subject areas and thus requires expert knowledge. The dilemma is reflected nicely in contemporary textbooks on informal logic (critical thinking): on one side there are general introductions to scientific methodology, enlightened “common sense,” with long passages and an analysis of scientific articles. Working laboriously through the material one slowly acquires the knowledge of an expert. On the other side there is an open market in literature introducing readers to the
wonderful power of how to tell a good argument from a bad one and influence people by being able to put a Latin name on short snippets from the press.

Johnson and Blair (2002: 352) remarked that formal logic began as a revolution at the level of theory that later filtered down into logic textbooks. Textbooks are instruments for passing the latest theory on to the next generation and hence the theoretical developments found in textbooks normally represent the precipitate from the theoretical controversies that occurred earlier in journal and monograph literature. In informal logic developments at the theoretical level were largely motivated by the attempt to teach students how to assess arguments in use. “Be clear about what tools are needed or need to be designed to do the job properly, then develop the theory needed to support the toolkit” (Johnson, Blair 2002: 352). But this “do-it-yourself” theory does not really help with the problems of foundations and our dilemma of the dialectician!

2.

According to Hitchcock the research programme of informal logic does not preclude the appeal to formal logic. It should also be mentioned that the research programme of formal logic does not preclude the analysis of real-life arguments. The latest developments in formal logic try to capture the subtleties of natural reasoning (non-monotonic, dynamic, preferential logics …). Some formal approaches confront “definitory” rules of standard formal logic with strategic-procedure rules which tell you how to win an argument (Hintikka, 2001). Jacquette proposes a different line of division – natural language versus symbolic language:

I propose that a logical theory or procedure is formal if and only if it adopts a specialized symbolism for representing logical forms that does not occur in ordinary nonspecialized nonsymbolic thought and language. Although I acknowledge that all of logic has to do with logical form, I do not agree that all expressions of logical form must themselves be formal. This distinction captures much of the received concept, since it includes all of symbolic logic and excludes nonsymbolic evaluations of validity or invalidity. As we might expect, formal logic by the proposed distinction will roughly include everything belonging to what has become the de facto criterion for formal logic in relations expressed by means of standard and nonstandard notational variations and extensions of the propositional and predicate-quantificational calculus. The definition additionally includes schematic and graphic treatments of syllogistic logic that have traditionally been regarded as more properly within the aegis of informal logic and critical reasoning. Informal logic by contrast on the present proposal is limited to the consideration of a proposition’s or argument’s logical form by discursive reconstruction within natural language, the use of counterexamples to discredit inferences, identification of arguments as committing any of the so-called rhetorical fallacies, and the like (Jacquette, 2007: 134).

I do not see a sharp line of division, though. There is the practical value of “formal” patterns recognized by informal theoreticians devising symbolic representations – diagrams, schemes, letters, … True, this is not a “pure” symbolic language – but these representations are on a par with, say, graphic treatments of syllogisms. Frege compared the use of symbolic language instead of natural language to the use of a microscope instead of the naked eye in biology. But even in biology one does not always need a microscope and sometimes too much precision is “over-kill.” Jacquette also adds:
The relegation of syllogistic logic, square of opposition, and argument diagramming methods to the genus of informal logic can now be seen as a kind of historical accident. Were it not for the emergence of more powerful algebraic methods of formal logic …., there is little doubt that the logic of syllogisms, Venn and other styles of diagramming, etc., would constitute the whole of formal logic as opposed to purely informal nonspecialized nonsymbolic logical methods (Jacquette, 2007: 134).

Yet it is difficult to see where the line should be drawn between an approach that uses argument diagramming methods and one that uses reconstruction within natural language – both will be used in a typical course on informal logic, though neither of them will find a place in a course on mathematical logic. Venn (or Euler) diagrams are sometimes useful in “informal” analysis, but they are, typically, part of more formal approaches.

But I agree with the starting point – all of logic is connected with form in one way or another. Skills of informal logic require a “formal” ability to move in the modal space: what could be true? Non-sequitur is a violation of form insofar as it represents a possibility for your premises to be true and your conclusion false. To take a simple example: “One who does not play cards can still be a bad judge, so one who does play cards can still be a good judge.” (Here is a counterexample: One who is not bribable can still be a bad judge, so one who is bribable can still be a good judge?) The procedure of resolving questions of form is always the same: keep something fixed (logical “constants” in classical logic) and vary the other parts. But what is fixed is not always given in advance and the possibility is not always logical – only relevant options are to be considered and it is notoriously difficult to explicate the notion of relevance. And of course, imagination is restricted by knowledge: if you know nothing about a certain field, then patterns alone will rarely be of any help (the moral from Sextus Empiricus). This explains one of the discrete charms of formal logic: even if ignorant of the topic, look for the logical form of an argument and calculate the result (whether the conclusion follows). But the most interesting arguments are not plain deductions, and for those that are (or are made such in a reconstruction) the interesting question is why one should accept the premises and what the alternatives are.

Johnson and Blair replace the standard of soundness (premise truth and deductive validity) in argument evaluation with a broader notion of argument cogency. An argument is cogent if and only if (i) its premises are rationally acceptable, (ii) its premises are relevant to its conclusion and (iii) its premises provide sufficient reason to accept the conclusion (the R.S.A. test for argument cogency). These three criteria are sometimes augmented with a fourth: (iv) that there are no known better reasons for an opposite conclusion. Fallacies are explained as being violations of one or more of these criteria.

I find the theoretical austerity of this proposal very attractive. But are these not just the ideals of enlightened common sense or elementary scientific methodology which require a respect for available evidence and “reasonable” inference, awareness of alternatives and a willingness to modify or reject those beliefs that fail to conform to the evidence (cf. a popular presentation in Sokal: 2008)? True, Johnson and Blair understand cogency as a replacement of soundness – in order to be good, arguments do not require true premises linked to their conclusions by valid inferences. But why should cogency not include deductions?

We can agree that in an argument the arguer proposes to the addressee that a set of propositions supports another and thereby invites the addressee to infer the latter from the
former. Also, the relation of support may, but need not be, one in which the supporting propositions purportedly deductively imply the supported proposition. As Johnson and Blair say:

Part, though not all, of the normative theory of argumentation has as its subject-matter the answer to the question, "What sorts of support relationship are logically cogent?" We take it that one subset of logically cogent support relationships are ones in which the supporting propositions logically imply the supported proposition, and we take the subject matter of formal deductive logic to consist (inter alia) of the study of forms of entailment, that is, valid implication relationships among propositions or sentences. It will be relevant to whether the addressee ought to infer the supported proposition from those adduced as support for it to know that the latter logically imply the former, but that is neither a necessary nor a sufficient condition of a justified inference.

... In addition, cogency includes standards that the grounds or premises of arguments must meet. Depending on the context, they must satisfy a requirement of truth, reasonableness or dialectical acceptability. We take informal logic to be the study of all the conditions under which an addressee ought to infer the target proposition from those adduced by the arguer as support for it. Thus the subject matter of informal logic is different from that of formal logic. Informal logic has the task of developing norms for the evaluation of arguments; formal logic has the task of developing the norms for formally valid implication relations (Johnson, Blair 2002: 360).

I agree with most of what is said, but the last sentence is puzzling. According to Johnson and Blair informal logic is about arguments and formal logic is *not*? They deliberately go against a use of 'argument' according to which logical proofs or demonstrations are counted as arguments. I agree that the sets of unrelated sentences or propositions they quote as an example of valid arguments should not be counted as arguments (of the type "The moon is not made of green cheese. So, 2 + 2 is 4."). But why could a (strictly deductive) proof that the square root of two is irrational not be a good argument? And what is wrong with more mundane reasoning that uses deductions, say: "The player who won both Wimbledon and the US Open in 1982 was the greater player in that year. Connors won both. Therefore, Connors was the greater player" (suppose I am wondering whether McEnroe or Connors was the greater player in 1982 and a friend of mine offers me this argument, Jackson, 1987: 102). The argument offered is a perfect logical deduction, but it is a good and helpful argument!

As Jackson notes: "The act of propounding an argument may have brought a half-buried piece of information to the surface, may have alerted me to the relevance of certain facts to my final concern, or may simply have enabled me to see how to get it altogether, so as to make transparent what i want to know" (Jackson, 1987: 102). Jackson calls this the "teasing-out" function of propounding arguments. There is another function of valid arguments – when an argument is propounded with the purpose of convincing someone of the truth of its conclusion then the person propounding the argument usually offers the hearer considerations that support the premises. The person to whom the argument is propounded is implicitly invited to ‘borrow’ these considerations and to be persuaded by them of the truth of the premises, and hence of the truth of the conclusion. In short: "The utility of valid argumentation (over and above the teasing-out function) in convincing audiences of conclusions lies in the evidence implicitly offered for borrowing by the presentation and selection of premises" (Jackson, 1987: 107).
The evidence offered for borrowing grounds the premises of an argument, but we need not go into the details of this account to see that exclusion of the deductive from the realm of the “real” argument is unjustified. For Johnson and Blair an argument is a set of reasons, that is, has been, or might be, offered to another person or other persons with the intention of persuading them, or some audience, to modify their beliefs, attitudes or behaviour (Johnson, Blair 2002: 360). This seems to be too narrow – the "teasing-out" function of propounding arguments is ignored. Well, they might point out that reasoning about the greater player in 1982 and a demonstration that the square root of two is irrational is a good piece of reasoning but not an argument (complex social, speech activity). The "teasing-out" function pertains to proper reasoning and not to proper argument.

We may grant that argumentation is a social and public speech activity involving more than one party, with practical goals (persuasion). One cannot argue without at least an imaginary audience or interlocutor. Reasoning, on the other hand, is a mental activity that can be performed privately and much reasoning is done before and outside the context of argument. Argumentation requires that its participants reason, so reasoning is necessary for argumentation. At the heart of the activity of argumentation is the offering of and response to arguments in the more narrow sense of reasons offered in support of or against claims (Blair 2001: 372). According to Blair 2001 (and perhaps not entirely consistent with other characterizations offered by Blair and Johnson) informal logic is restricted to the normative study of the cogency of argument, which is only one part of critical thinking and argumentation theory. I agree with this restriction, the relationship between reasoning proper and arguments within informal logic is complex, but, to be brief – since reasoning is necessary for argumentation, standards of good reasoning should always be respected in argumentation and good reasoning includes deductions. The norms of informal logic in so far as they embody norms of basic scientific methodology are norms of reasoning, not those of argumentation in the sense of proper dialogue.

Some theoreticians, most notably Walton (2008), understand informal logic as essentially pragmatic. For Johnson and Blair argumentation is a social activity paradigmatically carried out in the medium of a natural language. But even their approach to informal logic is described by Walton as a narrow, text-based, product-oriented approach to argument. In pragma-dialectics, as one of the influential theoretical models of informal logic, argumentative discourse is conceived as a certain activity (a critical discussion) aimed at resolving a difference of opinion by putting the acceptability of the ‘standpoints’ at issue to the test by applying criteria that are both problem-valid as well as intersubjectively valid.

The relationship between reasoning and argumentation within informal logic is complex. Pragmatic factors should be taken into account. Pragmatics is sometimes characterized as dealing with the use of language and effects of context. But this has various meanings – features of the context can be epistemic features indexed to the audience or the arguer (their belief systems, reasons, doubts, justifications), or conversational features of dialogue. In argument analysis, should we consider epistemic norms or conversational norms? Recall that an argument is cogent only if its premises are rationally acceptable. According to the first interpretation we should look at the beliefs of the audience (and / or the arguer). According to the second we should look at the conversation itself – what the audience has said, not what they think. Fallacies are explained as breaking the rules of proper dialogue. Circular arguments, for instance, are fallacious because they violate normative rules of dialogue which demand consensual starting points (cf. van Eemeren & Grootendorst, 2004).
I think that the pull toward the pragmatic in the conversational sense should be resisted. In a critical discussion the initial conflict of opinions could be resolved, but both parties might still be wrong. But we should be interested in the truth of the matter and not just in justifying our thesis and questioning or refuting the other party's thesis, by reasoned means, using accepted standards of evidence. This looks more like a theory of conflict resolution through argumentative discussion (compare Wreen, 1994: 302). Wreen wonders whether this is a theory of argumentation at all. I am willing to concede that the pragmatic approach is analysing argumentation in the sense of critical discussion as a complex social, speech activity. But informal logic understood as a set of norms of elementary scientific methodology is concerned with proper reasoning.

3.

Since the theory of arguments in everyday discourse is at issue, let me proceed by way of two examples. The first one is from a typical textbook – an “enlightened common sense” type (Thomson, 1996: 45):

If people became healthier as the affluence of the country increased, we would expect the population to be healthier now than it was thirty years ago. But over the last thirty years new illnesses, such as chronic fatigue syndrome, have appeared, and we have become more vulnerable to old diseases such as heart disease, strokes and cancer. So the increased wealth of the country has not produced improvements in the health of the population.

The passage illustrates two common flaws of everyday reasoning. Insufficient or suppressed evidence is the first. There is no information given in the passage about the general health of the population – perhaps some old diseases like smallpox and bronchitis are much less common. Perhaps people are relatively healthy for longer periods of their lives, before becoming ill in old age. And, secondly, the key term in this passage, “the health of the population,” is ambiguous. Its meaning is either the percentage of people's lives during which they are free from illness or the number of diseases in the population. If the first, then the argument fails – we do not have enough information upon which to base the conclusion. It seems even more likely that nowadays people live longer without having any disease. The number of diseases has perhaps increased precisely because we live longer (people usually become ill in old age).

I have more or less followed the analysis given by Thompson. The example should remind us of Empiricus and his treatment of “abatement.” This example (from a newspaper report) is somehow dry and colourless. Now add some emotions, engagement in hot issues and the pattern will reappear in more interesting clothing. Consider Paul Feyerabend's drastic views that science is just one of the many ideologies that propel society and that it should be treated as such. Feyerabend claims that negative opinions about astrology and other alternative practices are not justified by scientific research. I understand informal logic as embodying elementary scientific methodology which requires a respect for available evidence and “reasonable” inference, awareness of alternatives and willingness to modify or reject those beliefs that fail to conform to the evidence. The alternative practices so vigorously defended by Feyerabend (herbalism, alternative medicine, judgments based on intuition, rain dances ...) very often fail to meet precisely those standards. So what are Feyerabend’s arguments for his astonishing claims?
In his plea for democratic relativism Feyerabend dismissed the predominantly negative attitudes of scientists towards such phenomena as elitist or racist. In “The Unusual Story of Astrology” (1978) he critically analyses “Objections to Astrology,” a statement by 192 leading scientists (first appeared in The Humanist of September/October 1975). The scientists declare that concepts of modern astronomy and physics undermine the principles of astrology. Feyerabend first interprets the principles of astrology as a claim that celestial events (positions of planets, the Moon and the Sun ...) exert influence on human life. This is a very broad interpretation of astrology – a different, narrower and much more common definition is implied in the text of the 1975 statement: “It is simply a mistake to imagine that the forces exerted by stars and planets at the moment of birth can in any way shape our futures.”¹ This statement is now interpreted by Feyerabend as: “It is simply a mistake to imagine that celestial events (positions of planets, the Moon and the Sun ...) have any influence on human life.” And there is yet a third meaning of astrology in Feyerabend’s text, namely the thesis that celestial events (positions of planets, the Moon and the Sun ...) exert influence on life (in general) on Earth.

Nelson Goodman once wrote (1956) that the practical scientist does the business but the philosopher keeps the books. So let us do some book keeping. We have astrology-narrow (and interesting): the forces exerted by stars and planets at the moment of birth can shape the futures of human beings (their characters, personalities). Next we have astrology-broad: celestial events exert influence on human life. And finally we have astrology-empty (and largely uninteresting): celestial events exert influence on life (in general) on Earth. Well, Aristotle believed that the supra-moon region that covers the Moon and everything beyond is completely different from the terrestrial one and exerts no influence on the sub-moon world. So at least one historical theory is a target of Feyerabend's ferocious attack. And here is the trick: replace astrology-narrow with astrology-broad, compile a mass of evidence against the denial of astrology-empty and present this evidence as a counter-argument to the denial of astrology-narrow.

Feyerabend meticulously surveys various research reports (the influence of the activities of the Sun on life on Earth, correlations between organic and inorganic processes on Earth and various parameters of the Sun and the Moon; he quotes articles such as “Possible Effects of Extra Terrestrial Stimuli on Colloidal Systems and Living Organisms”, etc.). A lot of respect for scientific results and scientific methodology from someone so strongly opposed to “objective” scientific standards! After being bombarded with this counter-evidence, we read (as a minor objection, according to Feyerabend) that the scientists in the statement also complain that psychologists have not found the slightest evidence that astrology is of any, or even minimal value as an indicator of the past, present or future features of one's life. Feyerabend's reply would exhilarate every PR agency advising politicians: “This argument (against astrology, D.Š.) has no value, when we remember that astronomers and biologists were not even able to find the evidence already published and contributed by their own professions,” (presumably the articles quoted in length by Feyerabend).

For starters: first replace astrology-narrow (“the claim that knowledge of the apparent relative positions of celestial bodies is useful in understanding, interpreting, and organizing information about personality and human affairs and other terrestrial matters” is suggested by Wikipedia; “type of divination that involves the forecasting of earthly and human events

¹ Compare: http://www.americanhumanist.org/about/astrology.html
through the observation and interpretation of the fixed stars, the Sun, the Moon, and the planets” according to Encyclopedia Brittanica) with astrology-broad. Next refute astrology-empty (celestial events exert influence on life on Earth) and ignore powerful objections to astrology-narrow on the basis that those who objected to astrology-narrow were not able to find any evidence for astrology-broad. They were not even looking for it, but this will not prevent Feyerabend from switching over to the offensive. PR agencies advising political parties on how to win the elections prescribe the following rule: defense is for losers, when under attack (and justifiably so) do not, ever, retreat but make an assault. So Feyerabend, when faced with a decisive argument against his position (no evidence for astrology-narrow), drops in an offensive *ad hominem* (more will follow when we approach the end of “The Unusual Story of Astrology”): scientists are incompetent and they are unable to find any evidence.

Basically we have the same blunders as in the “health case” spiced with *ad hominem*: obliterating different senses of a single term (astrology-broad-narrow-empty) and suppressed evidence. True, life is short and our cognitive resources are limited, but here we encounter a deliberate selection of information. There is a ready explanation for this selection. Some of our beliefs are very precious to us, perhaps we have “invested” a lot in them and would like to protect them at all costs. Denunciations of Western imperialism, his critique of science itself, as well as his concern for environmental issues ensured that Feyerabend has become a hero of the anti-technological counterculture. One might sympathize with Feyerabend’s idea of a free society in which “all traditions have equal rights and equal access to the centres of power.” One attached to those ideals will easily ignore or suppress counter-evidence to the conclusion that “objectively” there may be nothing to choose between the claims of science and those of astrology, voodoo, and alternative medicine. This is the familiar “confirmation bias”, a useful definition of which can be found in Wikipedia (http://en.wikipedia.org/wiki/Confirmation_bias):

Confirmation bias is a tendency to search for or interpret new information in a way that confirms one's preconceptions and avoids information and interpretations which contradict prior beliefs. It is a type of cognitive bias and represents an error of inductive inference, or as a form of selection bias toward confirmation of the hypothesis under study or disconfirmation of an alternative hypothesis. Confirmation bias is of interest in the teaching of critical thinking, as the skill is misused if rigorous critical scrutiny is applied only to evidence challenging a preconceived idea but not to evidence supporting it.

And what to make of Feyerabend's claim that theoretical anarchism is more humanitarian and more likely to encourage progress than its law-and-order scientific alternative? Hugh Trevor-Rope once remarked that one of the early effects of the discovery that nature is strictly governed by impersonal laws was to reduce the enthusiasm for burning witches.

4.

Let me now try to draw some morals about informal logic. I do not think that there was a great deal of theory involved in spotting “non sequitur” in the arguments above. The main features traditionally ascribed to ‘the scientific method’ are a clear statement of a problem, careful confrontation of theory with fact, open-mindedness, and (potential) public availability or replicability of evidence (entry on “Scientific method” in Routledge Encyclopedia of
In the spirit of elementary scientific methodology, the starting points of argument analysis are very simple, almost trivial: first, identify the phenomenon you are dealing with. So, what does *that* (astrology, health …) mean? What exactly is claimed (conclusion) and what evidence is offered for those claims? I assume that ambiguity could sometimes be interpreted as the problem of relevance and sometimes as the problem of acceptability of a premise (once the various meanings are clearly distinguished one realizes that the premise is irrelevant or unacceptable) so all of the R.S.A. criteria of argument cogency were involved in evaluation of the two pieces of reasoning above. I could speculate that the pervasiveness of the fallacy of the ambiguity (*amphiboly*) can perhaps be explained with the way knowledge is encoded. Cognitive economy requires only one 'slot', different senses are then triggered by different contexts. The diagnosis of a dialectician remains the old scholastic: *distinguo* (be aware of different senses).

Let us now turn to the dilemma of the dialectician. Here is what Sextus has to say about *amphiboly*:

> In view of these points, then, the logical treatment of sophisms that is so much boasted about by the logicians is useless. We say similar things about the distinguishing of amphibolies. For if an amphiboly is a linguistic expression having two or more meanings, and if linguistic expressions have meaning by convention, then those amphibolies that are worth resolving — such as occur in some practical situation — will be resolved, not by the logician but by the people practiced in each particular art, who themselves have the experience of how they have created the conventional usage of the terms to denote the things signified, as, for example, in the case of the amphiboly "In periods of abatement one should prescribe a varied diet and wine" (*Outlines* II: 256; Mates, 1996: 168).

What kind of knowledge is required to notice the ambiguity in “the health of the population” or in Feyerabend’s definition of astrology? Do we have to be experts in the field (physicians, astronomers, astrologists)? I do not think so. General alertness, knowing something about different subjects and general education is required, but one need not be a specialist. And knowing something about different subjects has never been easier than today. I take the gist of Medawer’s pessimistic remark on scientific method to be that a typical scientist will absorb the elements and skills of scientific methodology through her education and practice. Something similar is true of informal logic. It is the attitude toward claims, positions, theses ... in general, including those defended or put forward in the public sphere of knowledge and opinion (usually media, matters of "polis" ...). Informal logic at its core embodies the attitudes of basic scientific methodology applied to the subject area accessible to every intelligent and educated person. To repeat – cultivating respect for available evidence and “reasonable” inference, awareness of alternatives and a willingness to modify or reject those beliefs that fail to conform to the evidence.

The view of informal logic as basic scientific methodology accords well with Toulmin's (1958, 2003) suggestion that argument analysis is like applied epistemology – in a successful argument sufficient evidence is given to support the conclusion, but the criteria of sufficiency depend on the nature of problems at issue. Take *ad hominem* – it is difficult to believe a broker who advises you to sell your stock while he himself is buying the very same stock. But ignoring the evidence for the proposition that celestial events exert influence on terrestrial life in general does not make scientists skeptical about astrology incompetent and unworthy of
belief! According to the textbook *ad hominem* facts about the proponent of the argument are irrelevant for the assessment of her argument. But when practical reasoning is at issue (what one should or should not do), some facts are clearly relevant. It is just not given in advance which facts to take into consideration.

Toulmin considers that logic is “concerned with the soundness of the claims we make” (1958:7), rather than with the task of telling valid from invalid inferences, and he also says that this requires more than mere calculations, it requires “experience, insight and judgment” (1958:188). According to my view the ability to tell valid from invalid inferences apart is a part of logic, but I agree with the stress on practice. In certain important aspects “applied” or informal logic is more like skill (playing piano or chess) and less like a firm corpus of theoretical knowledge. Memorizing dozens of fallacies (“theoretical” knowledge), all of them context dependent (not always fallacious), is useless without a “plain” ability to recognize a *non sequitur*: the conclusion does not follow – never mind the name – here is a counterexample. Elements of skill, pattern recognition, practice and the general knowledge required to assess arguments on various topics explain the difficulties in teaching this subject. The ability to recognize the same pattern in different contexts and the ability to find an example or the counterexample to the pattern (inference scheme, typical fallacy …) seem to be one of the main features of a “critical thinker.”

In the spirit of Medawer’s initial remark, the fact that we do not consciously practice a theory is very poor evidence that no such theory exists. We are sometimes confronted with the objection that there is no theoretical coherence to informal logic, which should instead be viewed simply as applied epistemology. I have argued that recognizing a *non sequitur* is largely a matter of “knowledge-how” (to be developed by practice) and not “knowledge-that.” But viewed from the theoretical perspective, informal logic comprises a variety of “tools.” In a sense, informal logic is a theoretical *retro* movement. Fallacies, inductive logic and scientific method have been routinely discussed in the much despised elementary logic textbooks since the nineteenth century. Standards were set by Aristotle – recall that Aristotle regarded logic as a tool for every science. This conception is reflected in the collective title *Organon* that we still use to refer to Aristotle’s logical writings. *Organon* contains elementary deductive logic and principles of argumentation, the study of fallacies, philosophy of language, the basic principles of definition and explanation, the basic principles of scientific methodology and epistemology … Informal logic, or logic in a broad sense, from the theoretical perspective, is such a toolbox, which perhaps explains the variety of theoretical approaches and foundational proposals.

Let me conclude these reflections on informal logic with an observation that ideals of logic in the broad sense are in certain aspects like those of democracy. That is, an extreme respect for form and procedure – even valuable beliefs are cancelled by bad reasons and fallacious reasoning. And the lesson can be more generally applied. We know from legal procedure that if an avowal is extorted, it is not valid. Gettier cases in epistemology have taught us that justified true beliefs do not count as knowledge if not supported in the right way. Some do not like this obsession with procedure. Yet, according to Sokal (2008), ideals of clear thinking, combined with a respect for evidence — especially inconvenient and unwanted evidence, evidence that challenges our preconceptions — are of the utmost importance to the survival of the human race in the twenty-first century. Strong words, but do they justify special courses of informal logic in which “theoretical” terms such as confirmation bias, amphibolity, suppressed evidence, *ad hominem*, etc. are introduced and explained?
As we have learned more about the world, we laugh, indulgently, at the "expertise" of Sextus. Wine would be very rarely prescribed nowadays in the abatement stage of disease. Expertise is changing, but even today there is an ambiguity to be spotted by the careful reasoner. And it is useful to master the ability to spot a non sequitur. I think that despite Sextus’ criticism and Medawer’s sarcasm, it is still useful to teach this discipline, if only to reaffirm the value of logic as part of the old “artes liberales.” The education and training deemed suitable for free persons was supposed to equip one with general knowledge, and interest in the pursuit of knowledge in the strict sense (and not, for instance, because of economic interests, characteristic of “artes illiberales”, supposedly less free vocational education). The distinction is nowadays perhaps obsolete, but only because we recognize the value of universal tools in any kind of “artes.” Logic in the broad sense, as elementary scientific methodology applied to subject areas accessible to every informed intellectual, is one such universal tool. Matters of politics typically are, but molecular biology and nuclear physics are typically not part of general knowledge – though things are changing rapidly. We live in the era of the explosion of knowledge. It has never been easier to access information; we are only ever a few clicks away from the manual which explains how to build an atomic bomb or the recipe for salmon with almonds. True, specialization is a law of every profession. Yet experts entering the public sphere of knowledge still have to make their results accessible to the rational audience. In order to pass a law on a nuclear power station, members of parliament need not know much (if anything at all) about gaseous diffusion separators. But they should be able to recognize a non-sequitur (require clarification or ask for more information).

**Literature**


