STUDIA METODOLOGICZNE
NR 35 • 2015, 63-78
DOI: 10.14746/sm.2015.35.5

JEAN-YVES BÉZIAU

Is Logical Relativity Irrational?

ABSTRACT. We start by discussing the two oppositions rational/irrational, anti-rational/anti-irrational. We design a hexagon of oppositions that is useful to explain these two pairs and their relationships. We then comment on the position of Louis Rougier, who can be considered as both anti-rationalist and anti-irrationalist and who has promoted logical relativity. In the third part we examine the evolution of logic and see in which sense logic can help us to be more rational.

KEY WORDS: rational, irrational, Lvov-Warsaw School, hexagon of opposition, paraconsistent logic

The anti-irrational hexagon

Anti-irrationalism is a word and a position promoted in particular in Poland, within the Lvov–Warsaw school, cf. the seminal paper by Ajdukiewicz [1934]. What is the difference between anti-irrationalism and rationalism, if any? Why use a kind of double negation, not being simply positive?

Let us start by examining the pair *rational/irrational*. We prefer to put in the first place this pair, rather than the pair *rationalism/anti-rationalism*. On the one hand to understand for example what is realism we have to understand what is reality, and on the other hand the suffix “ism” often has a negative connotation, related to behaviours which can be considered as irrational, a mix of belief and emotion, like with communism.

The prefix “ir” is one of the prefixes used to form opposition, variant of “il”, “in”, “un”, the variation being due to the configuration of the words. We say “irrelevant” but “illogical”, “incompatible” and “unknown”. Here is a table of pair of oppositions based on these syntactic constructions:

rational	irrational
responsible	irresponsible
regular	irregular
relevant	irrelevant
refutable	irrefutable
reversible	irreversible
logical	illogical
legal	illegal
literate	illiterate
real	unreal
limited	unlimited
certain	uncertain
usual	unusual
understandable	ununderstandable
decidable	undecidable
known	unknown
determined	undetermined
thinkable	unthinkable
imaginable	unimaginable
conceivable	inconceivable
compatible	incompatible
visible	invisible
accurate	inaccurate
active	inactive
finite	infinite

Using the theory of opposition, we say that two propositions are *incompatible*, when they cannot be true together. Among pair of incompatible propositions some are *contradictory*, this means they also cannot be false together, and some are *contrary*, this means they can be false together. Contradictory and contrary are themselves contrary concepts: according to these definitions, a pair of propositions cannot be at the same time a contradictory pair and a contrary pair, but it can be neither contradictory, nor contrary, being a *subcontrary* pair: when the two propositions can be true together but not false together. *Contrary/contradictory/subcontrary* form a trichotomy of contrary concepts and *incompatible/subcontrary* a pair of contradictory concepts.[1]

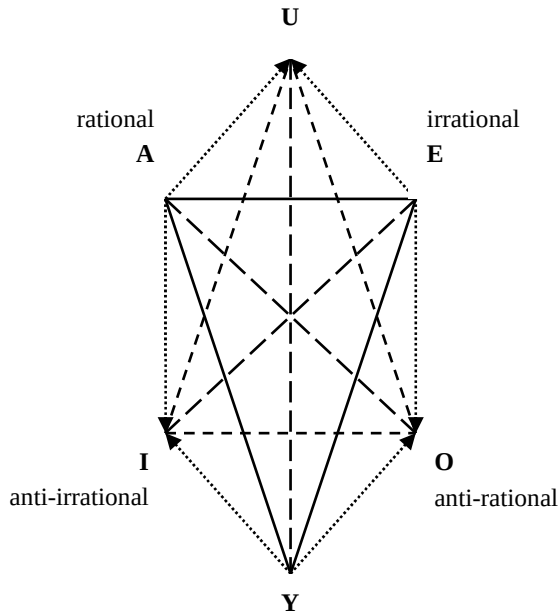
If *rational/irrational* was a contradictory pair, any further opposed related notion would reduce to one of the members of the pair. Anti-rational would be the same as irrational and anti-irrational would be the same as rational. In this case, this ‘’anti’’ way of speaking would be purely rhetorical. But is there any rhetorical effect without a semantical correspondence?

If *rational/irrational* is a contrary pair, there is something beyond, something which is neither rational, nor irrational. Do we have a word for it? We cannot call it *anti-rational*, because something which is irrational can be seen as anti-rational. This does not necessarily mean that anti-rational is equivalent to irrational, as we can consider that something can be anti-rational but not irrational. For a parallel reason, we cannot call *anti-irrational* something which is neither rational, nor irrational, because something which is rational can be seen as anti-irrational. This also does not necessarily mean that anti-irrational is equivalent to rational, because something can be anti-irrational but no rational.

This perspective can be summarized by the following hexagon of opposition:

---

[1] These concepts are related to the theory of opposition which is known as the *square of opposition*. This is a symbolic name, the theory does no reduce to a square. Here are recent works on this theory: Béziau and Payette [2008], Béziau and Payette [2012], Béziau [2012], Béziau and Jacquette [2012], Béziau and Read [2014]. About incompatibility, see Béziau [2016].



relation	traditional name	graphic representation
contradiction	**contradictio**	— — — — — — —
contrary	**contrarietas**	———————
subcontrary	**subcontrarietas**	- - - - - - - - - -
subalternation	**subalternatio**	.....

Fig. 1. The anti-irrational hexagon of opposition

The idea of a hexagon of opposition is that the position Y is the conjunction of the positions I and O.[2] So something which stands in the position Y is at the same time anti-irrational and anti-rational.

[2] The idea of a hexagon of opposition is mainly due to Robert Blanché (1898–1975). Details about this theory can be found in our paper "The Power of the Hexagon" [Béziau, 2012].

It is not clear what kind of name we can give to this position. Can we call it "arational"? This is an option. But then the trichotomy of contrary notions *rational/anti-rational/arational* will not be parallel to a trichotomy of contrary notions such as *social/antisocial/asocial*. Independently of the name let us try now to have an understanding of what can be such a Y position in the anti-irrational hexagon of opposition.[3]

The idiosyncratic Y position of Louis Rougier

How is it possible to stand at the Y corner of the rational hexagon, being at the same time anti-rational and anti-irrational?

A possible answer to this question can be given by examining the position of Louis Rougier (1889–1992). Rougier was a good friend of Moritz Schlick – he married his secretary, Lucy Friedman – and one of the main promoters of the Vienna Circle. In particular he organized in 1935 at the Sorbonne in Paris a big congress of scientific philosophy with the participation of Schlick, Carnap, Neurath and also Tarski, Lindenbaum and his wife, etc.[4] This event in Paris is central in the history of the relation between the Lvov–Warsaw school (hereafter LWS) and the Vienna Circle (hereafter VC). The proceedings of this important event were published in 8 volumes, the following year by Hermann.[5] They are presently available on-line on the website Gallica of the BNF – *Bibliothèque Nationale de France*. We reproduce below the cover of these volumes to give an idea of the topics dealt with during this event.

---

[3] We have called this hexagon, the *anti-irrational hexagon*. We could have given the name of another vertex but we chose this name to give the emphasis to anti-irrationality.

[4] Other famous people like Bertrand Russell were also present.

[5] Hermann later on was the official publisher of Bourbaki. They published the first Bourbaki's book in 1939. It is a booklet entitled *Théorie des ensembles – Fascicule de résultats*.

Fig. 2. Actes du Congrès International de Philosophie Scientifique Sorbonne, Paris, 1935

In his 1934 paper Ajdukiewicz writes the following about the relation between LWS and VC: “There are no unreserved supporters of the Vienna Circle in Poland; I do not know of any philosopher who has accepted and adopted the actual contents of the theses propounded by the Vienna Circle. At best, the affinity between some Polish philosophers and the Vienna Circle consists in a similarity of the basic methodological attitude and the kindship between the issues under investigation. The hallmarks of the methodological attitude include: *anti-irrationalism*, i e. the postulate stat-

ing that only such propositions can be acknowledged which are justified in a way that can be verified, and *linguistic precision*." And he adds: "Apart from those two hallmarks, one should also stress the third element, i.e. accepting the *logistic conceptual* apparatus and the powerful influence of *symbolic logic*." (our emphasis).

In fact there is no unity not only between LWS and VC but also inside LWS or VC, these groups gathering people having different points of view. This heterogeneity can indeed be seen as a positive feature. Nonetheless it is interesting to try to understand what gathered these people, besides purely geographical circumstances, which are reflected in both the names of LWS and VC. We can say that in both cases, logic was pivotal, logic not reduced to a technical tool, but logic in a wide sense, deeply connected with rationality.

Jan Woleński [2015] wrote the following: "Polish logicians strongly insisted that logic should not be restricted only to mathematics and required the co-operation of representatives of all fields in which logic might be used. Still another factor played an important role, namely the conviction about the social significance of logic as a weapon against all kinds of irrationalism. Tarski once said: religion divides people, logic brings them together."

Louis Rougier can be viewed as an anti-irrationalist in this sense. He was in particular fairly opposed to Christianism. Rougier considers that Christianism is confused and ridiculous comparing to the Greek culture, the symbol of rationality, where logic is a key feature: "The *logos*, here is the creation of the Greek genius, in the sciences, arts, moral and politics; and the *logos* means at the same time, discourse, reason, reasoning, relation and *proportio*." [Rougier, 1977, p. 42][6]

The *logos* has been however incorporated into Christianism. In the *New Testament* [John 1:1] the logos is identified with God. "In the beginning was the Logos, and the Logos was with God, and the Logos was God".

---

[6] "Le *logos*, voilà la création du génie grec, dans les sciences, les arts, en morale et en politique; et le *logos* veut dire tout à la fois discours, raison et raisonnement, rapport et proportio".

Fig. 3. Louis Rougier 1889–1992 and one of his books

Generally "Logos" is translated as "Word". A more rational perspective of Christianism has been developed by people like Leibniz or Hegel. This connection between rationalism and Christianism is maybe a way to understand why Rougier, although defending the Greek logos is also anti-rationalist.

But there are also some intrinsic "reasons". In his book bearing the nice title *Les paralogismes du rationalism*, Rougier analyses some basic principles that are considered as obvious by the rationalists – such as *the whole is bigger than the part* – that seems completely absurd to him in particular in view of the development of modern logic. For example the *whole is bigger that the part* is wrong according to modern set theory in the sense that there is a bijection for example between the set of the natural numbers and a proper subset of it, like the set of prime numbers (Galileo paradox).

This anti-rationalism of Rougier is connected with his idea of the relativity of logic, synthetically presented in his 1941 paper. According to him logic is relative in the sense that there is not an absolute universal way of

reasoning. One must in particular adapt his reasoning to the reality he his dealing with. This is one of the aspects of logical empiricism. Rougier was in fact ahead of his time, anticipating the perspective developed later on in artificial intelligence, promoting some non-classical logics like non monotonic logic.

Louis Rougier [1955] makes the following rather spectacular declaration: "With the discovery of the conventional and relative character of logic, the human spirit has burnt his last idol."[7] But as we have pointed out in a previous paper [Béziau, 2011], despite this declaration and his anti-rationalist position Rougier defends a rather naïve position regarding science, a kind of scientism, illustrated as follows in a criticism against the scholastic: "it was menacing during one thousand years to misguide the human spirit into a dead end, making it to lose its best chance: the scientific study of the Universes and the constant improvement, through science, of the human condition." [Rougier, 1926, p. 174][8]

As Grothendieck [1974] rightly pointed out in a paper entitled "The new universal church" (La nouvelle église universelle) scientism is even worse than any religion because although based on some irrational beliefs it pretends not to be so, to be purely rational:

"We hold that the most dangerous and the most powerful ideology today is the scientism. The power of the word 'science' on the spirit of the general public is of quasi-mystic and certainly irrational essence. Science is, for the general public and even to many scientists, like black magic, and his authority is both indisputable and incomprehensible. This accounts for some of the characteristics of scientism as religion. As such, it is also irrational and emotional in its motivations and more intolerant in its daily practice than any of the traditional religions it supplanted. Moreover, it does not merely claim that only its own myths are true; it is the only reli-

[7] "Avec la découverte du caractère conventionnel et relatif de la Logique, l'esprit humain a brûlé sa dernière idole."

[8] "Elle a menacé pendant mille ans de fourvoyer l'esprit humain dans une impasse sans issue, lui faisant manquer sa chance la plus grande: l'étude scientifique de l'Univers et l'amélioration continue, grace à la science de la condition humaine."

gion that has pushed arrogance to pretend not being based on any myth whatsoever, but only on reason, up to present as 'tolerance' that particular mix of intolerance and amorality it produces."

Can logic help us to be more rational?

In this third part we will examine more closely the relation between logic and rationalism. Can logic help us to be more rational and/or to avoid irrationalism?

To answer this question it is important to make the distinction between logic as reasoning and logic as theory of reasoning. We have emphasized this difference in a paper called "Logic is not logic" [Béziau, 2010], using the word "Logic" for reasoning and the word "logic" for the theory of reasoning, a difference parallel to the one between "History" (events) and "history" (theory of these events). This difference is very helpful to explain many paradoxes.

For example Descartes was very logical but against logic. Using our difference: Descartes was pro *Logic* but against *logic*. According to him, the theory of reasoning of Aristotle, syllogistic, does not help us to become more logical, on the contrary it confuses our mind. It is against the "bon sens", "la chose la mieux partagée du monde" (the best distributed thing in the world). Nevertheless Descartes did propose some "rules for the direction of our mind", this is the title of his book *Regulae ad directionem ingenii* (1628–1629) and later in *Discourse of a Method* [1937] he proposed 4 precepts saying: "Instead of the great number of precepts of which logic is composed, I believed that the four following would prove perfectly sufficient for me, provided I took the firm and unwavering resolution never in a single instance to fail in observing them".

Nowadays nobody will consider that these rules or these four precepts form a system of logic. However such general principles make sense in the spirit of the Polish school of logic which is strongly associated with the *methodology of science*. Tarski himself was much influenced by Blaise

Pascal – cf. his 1937 paper presented at the World Congress of Philosophy in Paris – who also was against syllogism but promoted the general methodology of the axiomatic method based on the trilogy of definetions/ rules/proofs.

Many systems of logic have been constructed in the era of modern logic, different from the syllogistic. The main system of modern logic is called "classical logic".[9] Nice name! But what does it mean exactly? In which sense is classical logic "classical"?[10] Should classical logic be understood as *logic* or as *Logic*? Someone may think that classical logic is the right description of the right way of reasoning. But similar criticisms as the one addressed to the syllogistic can be addressed to modern classical logic. Syllogistic has been taught during two thousand years and it is not clear at all that it has helped to turn humans more rational. It is now nearly one hundred year that people are teaching truth-tables and it is not clear that it has helped to improve mental health, and avoid sophistry, either.

In modern logic there are also some non-classical logics. Given a non-classical logic, like for example fuzzy logic, someone may think that we should reason in a fuzzy way because reality is essentially fuzzy. But on the other hand someone like William Kahan said about fuzzy logic: "Fuzzy theory is wrong, wrong, and pernicious. What we need is more logical thinking, not less. The danger of fuzzy logic is that it will encourage the sort of imprecise thinking that has brought us so much trouble. Fuzzy logic is the cocaine of science." (Personal communication to Lotfali Askar Zadeh).

Another non-classical logic that has also been strongly criticized is paraconsistent logic, a logic often presented as rejecting the principle of non-contradiction, one of the most sacred principles of logic.

---

[9] Classical logic is in fact not a system but a family of systems: classical propositional logic, classical first-order logic, classical second order logic.

[10] We will not reply to this question here because we are developing this question in our project «Naming logic(s)» where we are discussing question such as: In which sense minimal logic is minimal?

Jan Łukasiewicz, one of the godfathers of the LWS, wrote in 1910 a book criticizing Aristotle's defence of the principle of non-contradiction. Łukasiewicz did not construct systems of logic rejecting the principle of non-contradiction, but developed many-valued logic (inspired by some of the ideas of Aristotle about indeterminism). The first systems of paraconsistent logic were presented independently by Stanislaw Jaśkowski in Poland and by Newton da Costa in Brazil.

Someone may want to promote paraconsistent logic because that she believes that reality is contradictory in the spirit of Mao Tse-tung who in his 1937 essay *On contradiction* stressed that the law of contradiction, the unity and struggle of opposites, is the fundamental law governing nature and society, pointing out that the unity and identity of all things is temporary and relative, while the struggle between opposites is ceaseless and absolute. This position is now somewhat out of fashion. And paraconsitent logic is being liberated from contradiction, [Becker-Arenhart 2015].

On the other hand paraconsistent logic has been shown to be very useful in technology to deal with contradictory information. This can be described by the following 4 picture short story of the robot Emmy which was created in Brazil:

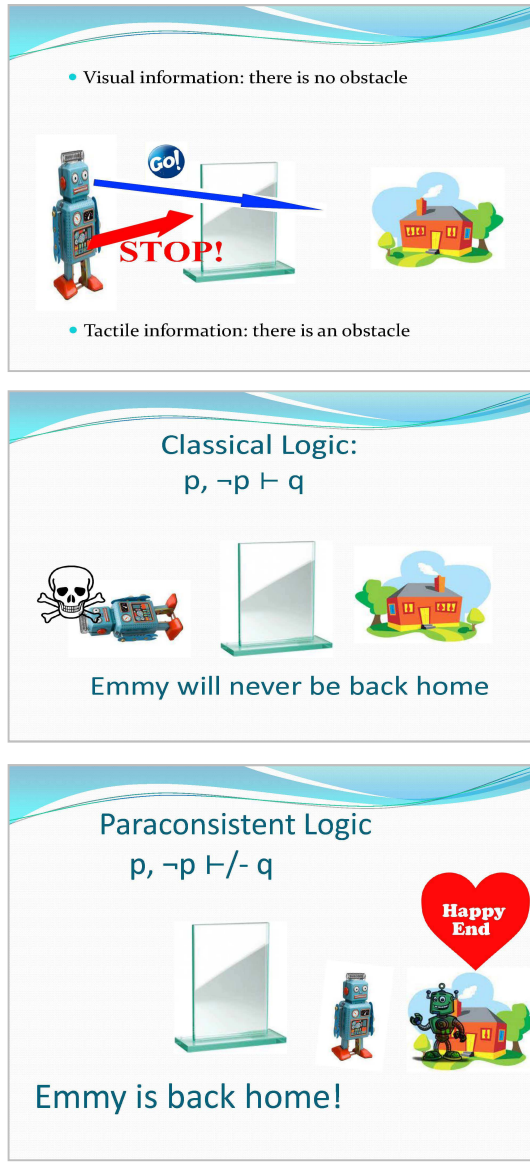


Fig. 4. Story of the paraconsistent robot Emmy

This is much connected with the relative spirit of Louis Rougier, according to which depending on the situation, we may use different types of reasonings, different *Logics*. The construction and elaboration of various systems of logic and a whole technology to combine or decompose these systems is seriously backing up this practice and the philosophical vision surrounding it. Universal logic has been developed in this spirit [see e.g. Béziau, 2006]. As I have recently argued, rationality is evolving [Béziau, 2015b], and the evolution of *Logic* is based on *logic*.

Acknowledgements

I would like to thank two anonymous referees as well as Katarzyna Gan-Krzywoszyńska for the kind invitation to write a paper for this volume. For me it is always a pleasure to contribute to the great Polish tradition of Logic and Methodology of Science. Dziękuję bardzo.

Bibliography

Ajdukiewicz K., (1934), "Logistyczny antyirracjonalizm w Polsce", *Przegląd Filozoficzny*, 37, pp. 399–408. English translation: "Logistic Anti-Irrationalism in Poland", *Poznań Studies in the Philosophy of the Sciences and the Humanities* 2001, 74, pp. 241–250.

Becker-Arenhart J.R., (2015), "Liberating Paraconsistency from Contradiction", *Logica Universalis*, is. 4, vol. 9, pp. 523–544.

Béziau J.-Y., (2006), "13 Questions about Universal Logic", *Bulletin of the Section of Logic*, 35, pp. 133–150.

Béziau J.-Y., (2010), "Logic is not Logic", *Abstracta*, 6, pp.73–102.

Béziau J.-Y., (2011), "Rougier: Logique et Métaphyisque", [in:] *Proceedings of the 4th World Conference on Metaphysics*, [ed.] P. Zordan, Dykinson, pp. 464–472.

Béziau J.-Y., (2012), "The Power of the Hexagon", *Logica Universalis*, 6, pp. 1–43.

Béziau J.-Y., (2015a), "The Relativity and Universality of Logic", *Synthese*, 192, pp. 1939–1954.

Béziau J.-Y., (2015b), "Beware of Rational Animals", [in:] *Representation and Reality: Humans, Animals and Machines*, [eds.] G. Dodig-Crnkovic, R. Giovagnoli, Heidelberg, Springer.

Béziau J.-Y., (2016), "Disentangling Contradiction from Contrariety via Incompatibility", *Logica Universalis*, double is. 2–3, vol. 10.
Béziau J.-Y., [ed.], (2012), *Universal Logic: an Anthology*, Basel, Birkhäuser.
Béziau J.-Y., [ed.], (2012a), Special Issue of *Logica Universalis* on the Hexagon of Opposition, vol. 6, is. 1–2.
Béziau J.-Y., Jacquette D. [eds.], (2012), *Around and Beyond the Square of Opposition*, Basel, Birkhäuser.
Béziau J.-Y., G. Payette [eds.], (2008), Special Issue of *Logica Universalis* on the Square of Opposition, is. 1, vol. 2.
Béziau J.-Y., G. Payette [eds.], (2012), *The Square of Opposition – a General Framework for Cognition*, Bern, Peter Lang.
Béziau J.-Y., Read S., [eds.], (2014), Special Issue of *History and Philosophy of Logic* on the square of opposition, vol. 35, issue 4.
Descartes R., (1637), *Discours de la méthode (Discourse on the method)*, Leyde.
Descartes R., (1701), *Regulae ad directionem ingenii (Rules for the direction of mind)*, published in 1628, Amsterdam.
Grothendieck A., (1974), "La nouvelle église universelle", [in:] *Pourquoi les mathmématiques*, Paris, UGE, pp. 11–35.
Łukasiewicz J., (1987), *O zasadzie sprzeczności u Arystotelesa* [On Aristotle's Principle of Contradiction], Warsaw, PWN.
Marion M., (2012), "An Early Defence of Logical Pluralism: Louis Rougier on the Relativity of Logic", [in:] Special Issue of *Logica Universalis* on the Hexagon of Opposition, [ed.] J.-Y. Béziau, vol. 6, is. 1–2, pp. 93–100.
Pascal B., (1657), *De l'esprit géométrique et de l'art de persuader (The art of persuasion)*.
Rougier L., (1920), *Les paralogismes du rationalisme*, Paris, Félix Alcan.
Rougier L., (1926), *Histoire d'une faillite philosophique: la scolastique*, Paris, Gauthier-Villars.
Rougier L., (1941), "The Relativity of Logic", *Philosophy and Phenomenological Research*, 2, pp. 137–158.
Rougier L., (1955), *Le traité de la connaissance*, Paris, Gauthiers-Villars.
Rougier L., (1977), *Le conflit du christianisme primitif et de la civilisation antique*, Paris, Copernic (first edition, Grece, Paris, 1974).
da Silva Filho J., Abe J.M., (2001), "Emmy: A Paraconsistent Autonomous Mobile Robot", [in:] *Laptec' 2001 The 2 Congress of Logic Applied to Technology*, São Paulo.
Tarski A., (1937), "Sur la méthode déductive", [in:] *Travaux du IXe Congrès International de Philosophie*, VI, Paris, Hermann, pp. 95–103.
Woleński J., (2015), "The Lvov–Warsaw School of Logic", *Stanford Encyclopedia of Philosophy*, Stanford.

Jean-Yves Béziau,
Federal University of Rio de Janeiro, Brazil,
University of San Diego, California[11], USA,
jyb.logician@gmail.com

[11] Visiting scholar at the Department of Philosophy of the University of California, San Diego, invited by Gila Sher and supported by a CAPES grant (BEX 2408/14–07).