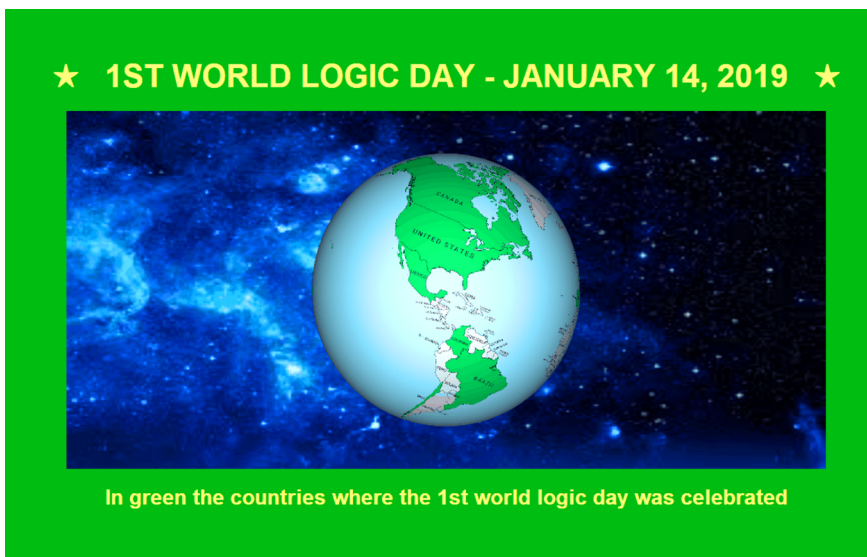Logica Universalis

Check for updates

1st World Logic Day: 14 January 2019

Jean-Yves Beziau

Abstract. We assess the celebration of the 1st World Logic Day which recently took place all over the world. We then answer the question *Why a World Logic Day?* in two steps. First we explain why promoting logic, emphasizing its fundamental importance and its relations with many other fields. Secondly we examine the sense of a one-day celebration: how this can help reinforcing logic day-to-day and why logic deserves it. We make a comparison with other existing one-day celebrations. We end by presenting and commenting the logo of the World Logic Day.

Mathematics Subject Classification. Primary 03-01; Secondary 03A05, 03A10.

Keywords. Logic, Logos, Reasoning, Aristotle, Boole, Tarski, Gödel, Universal language, One-day celebration.

In green the countries where the 1st world logic day was celebrated

www.logica-universalis.org/wld

Birkhäuser

1. The Advent of the 1st World Logic Day

January 14, 2019 was organized the *1st World Logic Day* in about 60 locations all over the world. The three countries with the highest number of celebrations were Poland (8), Brazil (5) and Russia (5). The success of the celebration in Poland is not surprising if we consider that the *World Logic Day* is connected with Alfred Tarski and that the Lvov-Warsaw School was one of the most important schools for promotion of logic in the first half of the twentieth century.[1] Nevertheless 8 celebrations all over the country (two in Warsaw—Fig. 1 and one in each of the following cities: Poznań, Łódź—Fig. 2, Toruń, Wrocław, Katowice, Kraków) is for a start a high number showing that logic in Poland is not only something from the past.
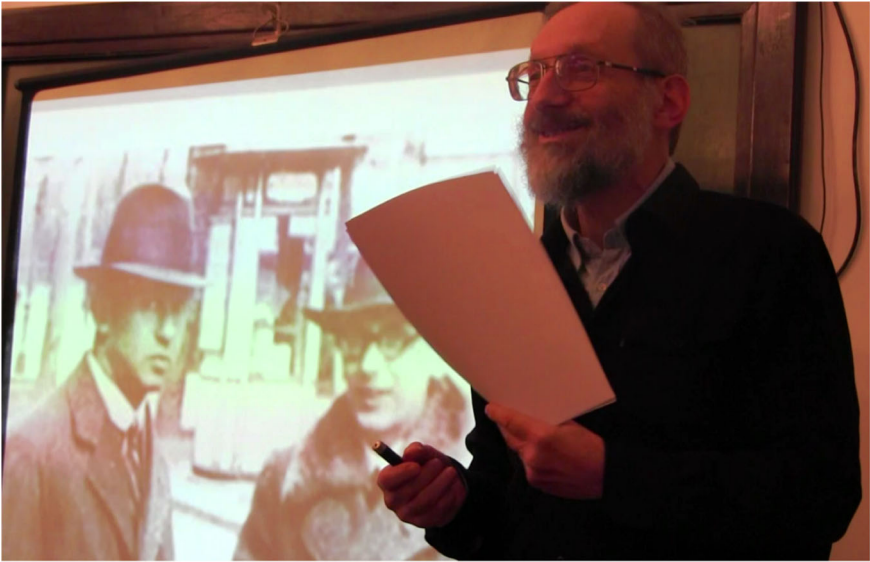

FIGURE 1. Celebration at the Department of Philosophy of Warsaw University

---

[1] About this school see [16], a recent book of 800 pages with a systematic presentation of all the main members of this school and their works.

FIGURE 2. Celebration at the Department of Logic of Łódź University

Five celebrations in Brazil may sound strange for those who don't know the development of logic promoted mainly by Newton da Costa since the 1960s in this country.[2] Da Costa, who will complete 90 years in a few months, gave a talk at the celebration in Florianópolis, the town in the South of Brazil where he is presently living. There were also celebrations all over Brazil: in the two main cities, Rio de Janeiro and São Paulo, in the capital, Brasília, and in Fortaleza (Fig. 3), the most important city in the Northeast of Brazil.

FIGURE 3. Celebration in Fortaleza, Ceará, Brazil

Five celebrations in Russia is not so surprising considering the size of the country and the important logic tradition there. There were celebrations in the two main cities, St Petersburg and Moscow, in Krasnoyarsk, Siberia (Fig. 4), but also in some smaller towns: Innopolis, near Kazan in Tatarstan, and Ulyanovsk.

---

[2]Da Costa spent some time in Berkeley and invited Tarski to give a series of talks in Campinas in 1975, which have recently been published (see [30]).

FIGURE 4. Celebration in Krasnoyarsk, Siberia, Russia

There were other countries with several celebrations, among them let's note Portugal: despite the small size of the country there were three celebrations: Lisbon, Aveiro, Funchal. The variety of the countries where the *World Logic Day* took place is quite impressive: not only expected countries like Germany, France, Italy, Mexico (Fig. 5), Canada, Hungary, USA, Spain, Greece, but also less expected ones such as Saudi Arabia (Fig. 6), Kazakhstan, Vatican, Moldavia and Iran.

FIGURE 5. Celebration in Puebla, Mexico

Figure 6. Celebration in Mecca, Saudi Arabia

The celebrations had various formats: a main single lecture like in Zagreb (Croatia); a roundtable like in Valparaiso (Chile); a workshop with several lectures like in Kolkata (India); a symposium like *LogicaMente* organized by the Research Institute for Neuroscience, Education, and Didactics (RINED) of the Fondazione Patrizio Paoletti (FPP), in Assisi (Italy); or simply a cake party, like in Perth (Australia), a beer party, like in Bogotá (Colombia) or a logic café, like in Berlin (Germany).

During these meetings people talked in particular about the logical activities of their localities. In Sofia (Bulgaria) there was a workshop with title "Logic in Bulgaria : The History, the Present and the Future" gathering the logicians of Sofia University *St. Kliment Ohridski* and those of the Bulgarian Academy of Sciences, as well as master students in logic. In Kiev it was decided to establish an Ukrainian Logic Society, which will in particular promote an Ukrainian Logic Prize. The winner will join the winners of other logic prizes for the *2nd Logic Prizes Contest* which will take place at the 7th UNILOG scheduled in 2021 in Greece.

FIGURE 7. Celebration in Kiev, with the creation of the
Ukrainian Logic Society

2. Why a World Logic Day and How to Launch It

The idea of a *World Logic Day* came to my mind when some time ago I
noticed that Kurt Gödel and Alfred Tarski, besides being the two most famous
logicians of the twentieth century and two of the greatest logicians of all time,
had something else in common: Tarski was born January 14, 1901, Gödel died
January 14, 1978. It is a kind of funny coincidence, not necessarily a sufficient
reason to create a *World Logic Day*, but a good starting point, a source of
inspiration.

The reason to have a *World Logic Day* is of course to promote logic. This
is a kind of tautology. To go beyond this tautology there are two questions:
Why promoting logic? Why in this way? Answers will be given in the following
sections.

Before that, let's say a few words of how the launch of the *1st World
Logic Day* was organized. It is important to do the right thing at the right
time, not too early and not too late. In June 2018 was organized the *World
Congress and School on Universal Logic* (UNILOG) in Vichy, part of a general
project for the development of logic as described in "Universal Logic: Evolution
of a Project" [7]. During this 6th edition of UNILOG there was the *1st Logic
Prizes Contest* with 9 countries competing. The papers of the contestants were
published in a double special issue of *Logica Universalis* (volume 12, issue 3–4,
2018), including the introductory paper "Logic Prizes et Cætera" [8] where in
the last section the idea of a *World Logic Day* on January 14 is presented. This
paper was published on October 24, 2018. At this time it was not yet clear

that the *World Logic Day* would be launched in 2019. It was an idea in the air, conceived from the headquarters of LUA located in Boole crater (Moon 63.7N 87.4W) (see [8]), and nothing was concretely prepared for the landing. But for sure the *1st Logic Prizes Contest* was a good primordial soup for the launch of the *1st World Logic Day*, which in turn would be a good stimulus for the creation of more logic prizes for the *2nd Logic Prizes Contest*.

Then by mid December 2018, 1 month before January 14, 2019, conditions were good, no storm in sight, no reason to wait one more year. I wrote to many colleagues all over the world and designed the webpage for the *1st World Logic Day*. There were many positive feedbacks. Not all the people I wrote to were able to organize something in time. On the other hand there were some spontaneous unexpected proposals. The event was widely announced (see some posters in Fig. 8) and the landing went smoothly and successfully. We can confidently expect on January 14, 2020 an even more spectacular *2nd World Logic Day*.
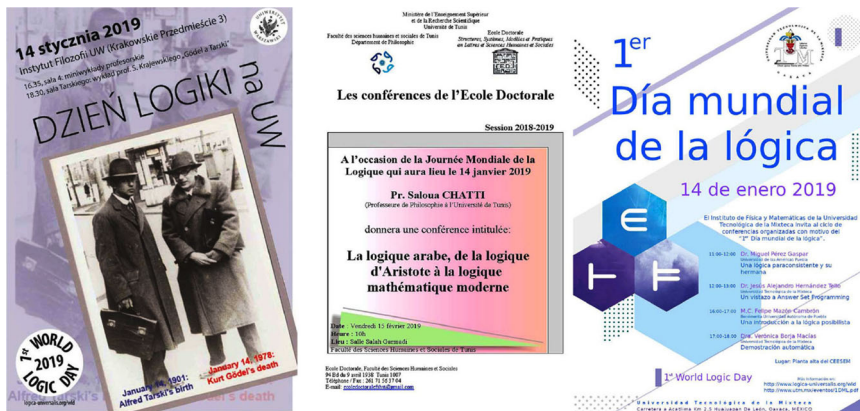

FIGURE 8. Some posters for the *1st World Logic Day*

3. Logic Ahead

Generally people don't really know what logic is or/and have a reduced vision of it. For the layman logic merely reduces to the adjective "logical". He has no idea that there is a science of logic, like there is the science of living beings, biology. However there are some logical beings, namely human beings. These living beings have been characterized as "rational animals".[3] The word "rational" is of Latin origin, corresponding to the word "logical", of Greek origin. To be logical has been considered by the Greek as the typical feature of human beings, hence nicknamed *logical animals*. But what does it mean exactly? The

---

[3]Also as "homo sapiens", about the relation between the two characterizations see [4].

word "Logos" is a central word of Greek civilization. It has four basic meanings described by the following picture (Fig. 9):
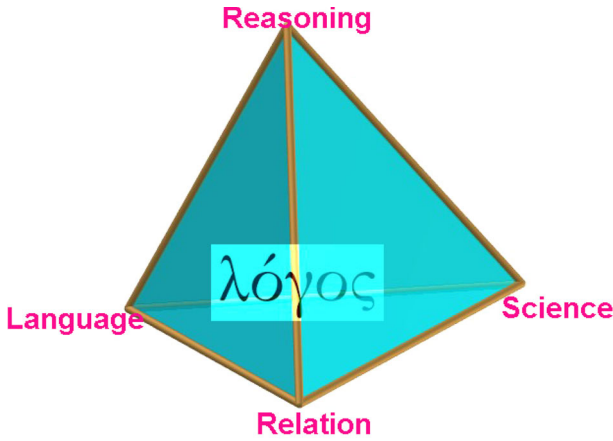

FIGURE 9. The four aspects of the *Logos*

These different aspects of the *Logos* are linked between one another. Science is based on reasoning and is expressed through language. Reasoning and the development of science consist in understanding relations between things and constructing relations that explain reality.

Logic itself is related to the four aspects of the *Logos*. It is a science, the science of reasoning. And it not only uses languages and relations as other sciences do but also provides an understanding of what languages and relations are, as shown by the theory of categorical propositions synthetized in the square of opposition of traditional logic, or by symbolic first-order logic in modern times.

It is important to emphasize that logic does not reduce nor to a particular theory (set theory, model theory, recursion theory, proof theory, etc.) or system (syllogistic, first-order logic, lambda calculus, type theory, etc.), nor to rationality, as sharply contrasting with emotions, feelings, sensations.

There is the famous adage by the great philosopher and mathematician Blaise Pascal: "Le cœur a ses raisons que la raison ne connaît point" (The heart has its reasons, of which reason knows nothing). And more recently there was a quite popular song by the music band Supertramp entitled "The Logical Song" (1979, Fig. 10). It runs as follows:

FIGURE 10. The Logical Song by Supertramp

When I was young, it seemed that life was so wonderful
A miracle, oh it was beautiful, magical
And all the birds in the trees, well they'd be singing so happily
Oh joyfully, playfully watching me
But then they send me away to teach me how to be sensible
Logical, oh responsible, practical
And they showed me a world where I could be so dependable
Oh clinical, oh intellectual, cynical.

But catching logic within a simplistic dichotomic opposition is a kind of caricature, result of a weak way of reasoning, producing a floppy understanding. In the *Koran* logic is presented as the science providing to King Solomon the understanding of the language of the birds (see e.g. [1]). And the other way round: logic is based on senses, in particular, but not only, vision (logicians have paid more and more attention to visual thinking, see e.g. [22]—Fig. 11). What is developing now is the study of the link and interaction between sensibility and rationality with studies on logic and color [19], logic and music [21], logic and emotion [5], and probably soon logic and taste, logic and smell, etc.
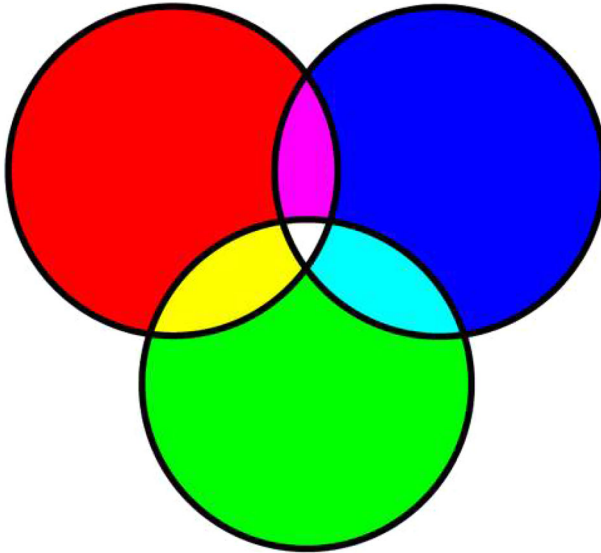
FIGURE 11. Venn diagram and the logic of color

With Aristotle, logic has been considered as fundamental and it was the case in this tradition during many centuries. Logic then gradually faded because on the one hand there was no proper evolution of this science and on the other hand other sciences like mathematics, physics and biology grew fast and fat, taking the center stage.

However logic made a spectacular come back by the middle of the nineteenth century especially with the work of Boole, who wrote the famous book *The Laws of Thought* (1854, [10]), in which he tried to catch reasoning with mathematical tools. The consequence of Boole's work is that it also changed mathematics and led to the development of computation (see e.g. [6]).

One of the fundamental outcomes of modern logic is the distinction between reasoning and computing. Logicians (Gödel, Church, Turing, Kleene) were able to give a precise characterization of what is an algorithm, and this was fundamental for the elaboration of the theory of computation. On the other hand results such as Gödel's incompleteness theorem (1931) and Church's undecidability theorem (1936) show that contrarily to the dream idea of Leibniz it is not possible to build a thinking machine.

In modern times logic has expanded in all directions, old and new. For example Gödel, who was much interested in theology, provided a new proof of the existence of God and in a different perspective the relation between brain and reasoning started to be systematically studied, with the advances of neuroscience. Since the beginning of the twentieth century logic is related with four basic fields:

- Mathematics
- Philosophy

- Computer Science
- Linguistics

and it is currently connected with many other fields and subfields:

- Psychology
- Cognition
- Neuroscience
- Artificial Intelligence
- Theory of Mind
- Law and Justice
- Ethics
- Politics
- Argumentation
- Critical thinking
- Physics
- Biology
- Economy
- Theory of Classification
- Criminology
- Theology
- Information
- Anthropology and Sociology

We will not here enter in details about each of these topics, but make just a few comments. Biology was the first love of Tarski (similarly to Aristotle) and he encouraged Woodger to apply logic to biology [33]. The relation between logic and physics was promoted by many people, such as Garrett Birkhoff, Paulette Février, Patrick Suppes, Tarski himself (cf. the congress organized in Berkeley in 1957, see [18]). István Németi developed a line of reseach about logic and the theory of relativity in Budapest (Hungary), the *1st World Logic Day* was celebrated there with the talk "Isotropy, principle of relativity and the possible structures for worldview transformations" given by Judit Madarász and Gergely Székely. In Cagliari (Sardinia, Italy) was organized on January 14, 2019 the workshop "New frontiers of Logic: Algebraic and Physical perspectives" by the research group of Roberto Giuntini more centered on quantum physics. And logic is connected with ethics since Aristotle. The celebration at St. John Fisher College (Rochester, USA) was an open discussion of John Corcoran's paper "The Inseparability of Logic and Ethics" [14].

So in some sense logic is everywhere. But the problem is that logic is much scattered. There is the tendency of logic to disappear as a subfield of other fields, to be lost under fashionable umbrellas. This sharply contrasts with the project of *unity of science* developed in the first half of the twentieth century where logic was the main pillar, the foundational basis, the inner structure (see [12, 24, 29]). Science is nowadays dismantled in particular by over specialization and often overshadowed by the success of practical technologies such as computer applications. The promotion of logic is a way to give back to science a solid basis and unity. But also to promote rationality practically at

the level of politics, ethics, justice, information, decision-making, where people are often driven by emotional confusion.

4. From Daily Celebration to a One-Day Celebration

Logic, like other academic fields, can be promoted everyday through:

- teaching at universities,
- organization of seminars, workshops, congresses,
- publications of papers in journals or books.

The place of logic is quite good if we consider it as a subfield of mathematics or philosophy. In the world there are about 30 journals of logic. A number much higher than the number of journals of topology or esthetics. If we consider scientific events, there are also lots of events directly or indirectly connected to logic. And if we put altogether the classes of logic given in departments of mathematics, computation and philosophy, the total is quite impressive. In this sense logic is celebrated daily and that's very good.

To have a one-day celebration is to go a step further. The idea is of course not to replace day-to-day activities by a one-day celebration. But to reinforce and extend the daily celebration of logic by:

- gathering people of the same location who have interest for logic,
- giving more visibility to logic within a given institution,
- expanding/exporting logic outside universities.

In one university logicians are spread in different departments and most of the time do not meet and even do not know each other or/and the work of the others. To have a one-day celebration is the opportunity to organize a meeting at least once a year between all these people and hopefully this will extend to more regular activities. And in a case of a big city or a megalopolis this is the opportunity to gather people from different universities having an interest for logic. A one-day celebration is a strategy for reinforcing neighborhood.

Nowadays there are more and more congresses everywhere in the world. Someone from a given university, let's say Ralf, working in intuitionistic proof theory at the University of Krutchenberg in Poldavia, will make thousands of kilometers traveling to the other end of the universe to meet specialists of his favorite research speciality, supported by a €5-million GROPIF research project, funded by Europe Union. That's nice. But paradoxically he has never met, or maybe just once over internet, Cathy who is working on the history of Jaina seven-valued logic in the department of philosophy of the same Krutchenberg University. Globalization is good but it is important to avoid that it destroys domestic life. To organize local events such as a one-day celebration of logic is easier, cheaper and more ecological.

When I was organizing an event in Easter Island [9], Peter Singer from Princeton University sent me a short e-mail (February 22, 2016) with as sole content the question "Have you considered this aspect of your choice of location?" followed by a link to the article "A climate scientist who decided not to fly" [20]. A *World Logic Day* is indeed perfectly compatible with the perspective of a no-fly science without planes. And since Singer is especially known

for his book *Animal Liberation* [25], let's take the opportunity to say that beside(s) rational animals, other animals are most welcome to join the *World Logic Day*: Schopenhauer's poodle, Schrödinger's cat, Zeno's tortoise, Morris's naked ape, Girard's scapegoat. Even Diogenes is welcome to join us with all his dogs, provided they come properly dressed! Showing the possibility to be logical without being cynical. January 14 is incidentally also the *National dress up you pet day* [23].

The second point is to turn logic better known by itself within a given university, where generally there is no department of logic, people working in logic being scattered in different departments, faculties, buildings. Academics who are not logicians may then start to see the real value of logic and have more interest for this science.

The third point is to expand logic outside universities. This can be done at three levels:

- high schools,
- companies,
- everyday life.

Why is logic not taught at high schools? Logic was called at the time of Port Royal "The art of thinking" [2]. Is it not important to help the young to develop the art of thinking, beyond the study of some particular topics? Logic has much to do with pedagogy. This is what some people are trying to promote, in particular the logic group of Stanford University [17]. To have a *World Logic Day* is a way to fortify such kind of initiative. And this is at the same time a way to develop a better interaction between universities and high schools.

The interaction with companies is also another important matter, in both directions. Logic can be applied to companies not only at the level of software or hardware but also at the level of management, as is doing the *Center for Applied Rationality* of Julia Galef in California. On the other hand companies can support the development of the science of logic with involvement in academic life, whether in the daily life of universities or at congresses. This is what has recently been done by *Blender Logic Inc.* at the 6th UNILOG in Vichy. And his director, Erik Thomsen, decided to join the *1st World Logic Day* by organizing a celebration at *Cambridge Innovation Center*, a consortium of startups in Cambridge, MA, where his company is based.

Finally logic can be promoted at a level of a general audience: for all kind of people, of all ages. This is not so absurd if we think for example of *Alice's Adventures in Wonderland*, a book written by a mathematician who was strongly interested is logic and wrote several books on the subject. But Lewis Carroll's novels are also full of logic (Fig. 12).

And logic is not only for children, more logic in everyday life can turn life more magical. Raymond Smullyan (1919-2017) was a great logician [4] who was at the same time a pianist and a magician, He wrote numerous funny books

---

[4]He has in particular generalized in his youth Gödel's theorem in a non trivial way [26] and has emphasized the links between Gödel's incompleteness theorem and Tarski's undefinability theorem [27].

accessible to a wide audience (see [28] for an overview). A one-day celebration is a good way to promote logic among a larger public, by organizing for example events in public libraries.

FIGURE 12. Lewis Carroll: Logic wherever you go! (This picture is from the website Kingdom of Logic of Yuri Bladinov. Alice with the Cheshirecat was also used for the poster of the celebration of the *1st World Logic Day* at Adam Mickiewicz University in Poznań, Poland)

Having examined why a one-day logic is good for logic, let's see the other way round: does logic deserve a one-day celebration? Let's see first what kind of one-day celebrations already exist. Everybody has his/her own one-day celebration: his/her anniversary. The day of logic is related to that, not because logic was born on January 14, but because it is the day of birth of one of the greatest logicians ever, Alfred Tarski. As an extension of individual anniversaries there are national anniversaries, July 14 being one of the most well-known, but it really makes sense only for France.

Then there are some religious days, Christmas, December 24, being the most famous one. Not only because Christianism is one of the most important and widespread religions, but also because it has been extended beyond the limit of Christianism in particular through the importation of external

elements. Few days after Christmas, there is an even more universal one-day celebration, it is New Year's Eve. Like Christmas it is rather a two-day celebration. And like Christmas the idea is to be together, but in a more general way, Christmas being rather a family business, whereas New Year's Eve extends to friends and even to all humanity. New Year's Eve is a celebration without definite object or subject if not time and togetherness, the climax being December 31st midnight.

Now let's have a look at one-day celebrations with an object. There are some one-day celebrations which are reduced to a particular culture and country, like the ones which can be found in the list of national days in the United States, including the *National dress up you pet day* we already talked about [23].

For more international one-day celebrations, it is good to have a look at the list of official International Days of United Nations [31]. Most of them are not widely well-known. One of the reasons is that their objects are often quite particular. It can be for example about a disease (February 4 is the cancer day), a culture (April 23 is the Spanish language day), or a specific phenomenon (June 30 is the asteroid day). There are however some more universal topics, such as happiness. But few people know that March 20 is the international day of happiness, and it is not clear whether people are getting happier this day than the other days.

There are only two one-day celebrations related to academic fields: statistics and philosophy. None of them is celebrated yearly in a fixed day of the year.

The statistics day is celebrated on October 20 every 5 years and its existence is due to the fact that UN has a statistics division, this day being therefore directly connected with inner activities of UN, as explained by the resolution: " Recognizing the long history of official statistics and the facilitating role played by the United Nations since the creation in 1947 of the Statistical Commission, which was tasked with promoting the development of national statistics and improving their comparability, coordinating the statistical work of specialized agencies, developing central statistical services of the Secretariat, advising the organs of the United Nations on general questions relating to the collection, analysis and dissemination of statistical information and promoting the improvement of statistics and statistical methods generally." [32]

Interesting enough, Boole is notified in this resolution, emphasizing that the 2nd celebration of the *World Statistics Day* in 2015 coincides with his bicentenary: "Noting also that 2015 marks the bicentenary of the birth of George Boole, whose work on the application of the principles of logic as a form of algebra underpins modern computer science and which form of algebra today bears his name." [32] No explicit connection between statistics and logic is mentioned here, but one can understand through the very argument given above why statistics, like many other fields, has a relation with logic.

The philosophy day itself is celebrated yearly, the third Thursday of November. As recalled in [8], I was myself invited to take part to this celebration at the headquarters of UNESCO in Paris at one of the first editions and presented a talk about a *World University* [3]. The recognition by

UN/UNESCO of a *World Logic Day* would be coherent with these two one-day celebrations and would reinforce them. But why logic really deserves a one-day celebration will be clarified in the next and final section.

5. The Logical Logo of the World Logic Day.

To have a logo for the *World Logic Day* is logical, especially considering that "Logo" is rooted in "Logos", another aspect of the multifaced science of logic. The logo of the *World Logic Day* is presented in Fig. 13 below.

FIGURE 13. Logo of the *World Logic Day*

The five-pointed star is one of the most universal symbols and can be found in many flags. The green color is connected with hope (about the meaning of colors see e.g. [5]). The green star is in fact the symbol of the universal language Esperanto (see Fig. 14). Blue is tied with certainty. Circling the green star of hope in blue may ensure that things will turn out well ... Yellow is considered as the color of creativity and rationality. At the end we have a logo with the same three colors as the ones of the flag of Brazil (Fig. 14).

FIGURE 14. The Flag of Brazil and the Flag of Esperanto

This makes sense if we consider that the *World Logic Day* was launched from Brazil and moreover in January from Rio de Janeiro, literally meaning *River of January*, where the *1st World Logic Day* was duly celebrated at the Brazilian Academy of Philosophy on January 14, 2019 (Fig. 15).

FIGURE 15. The poster of the celebration of the *1st World Logic Day* in Rio de Janeiro

The idea of Ludwik Lejzer Zamenhof (1859–1917), creator of Esperanto, was to promote peace and understanding among human beings by the development of an artificial universal language. This did not work. English is itself being used as a universal language and it makes sense if we consider some of its typical features, already pointed out at the end of the nineteenth century by Michel Bréal, who established "semantics" [11], and who was the teacher of Ferdinand de Saussure.

The question of a universal language was popular among logicians at the turn of the twentieth century. Giuseppe Peano created one, *Latino sine flexione*, Louis Couturat another one, *Ido* (see also his very interesting book co-authored with Léopold Leau about the question of universal languages [15]),

and Rudolf Carnap was fluently speaking Esperanto as explained in his intellectual autobiography [13].

But more important than a universal language is human reason which itself is by nature universal and that's an excellent reason to promote logic. Logic is not one field among others. If we take logic seriously, as the study of reasoning, and if we consider that reasoning is the distinctive feature of human beings, considered as rational animals since the antiquity, then logic is something really special. The *World Logic Day* is the celebration of humanity.

Acknowledgements

References

[1] Akrami, M.: From logic in Islam to Islamic logic. Log. Univers. **11**, 61–83 (2017)

[2] Arnauld, A., Nicole, P.: La Logique ou lart de penser (Logic or the art of thinking). Savreux, Paris (1662)

[3] Beziau, J.-Y.: Les universités face la globalisation: vers une université mondiale? In: Naishtat, F. (ed.) Journée de l'Unesco 2004, vol. 10, pp. 207–211. Unesco, Paris (2006)

[4] Beziau, J.-Y.: Being aware of rational animals. In: Dodig-Crnkovic, G., Giovagnoli, R. (eds.) Representation and Reality: Humans, Animals and Machines, pp. 319–331. Springer, Cham (2017)

[5] Beziau, J.-Y.: A chromatic hexagon of psychic dispositions. In: Silva, M. (ed.) How Colours Matter to Philosophy, pp. 273–388. Springer, Cham (2017)

[6] Beziau, J.-Y.: Is the principle of contradiction a consequence of $x^2 = x$? Log. Univers. **12**, 55–81 (2018)

[7] Beziau, J.-Y.: Universal logic: evolution of a project. Log. Univers. **12**, 1–8 (2018)

[8] Beziau, J.-Y.: Logic Prizes et Cætera. Log. Univers. **12**, 271–296 (2018)

[9] Beziau, J.-Y., Correia, M.: Squaring Easter Island. S. Am. J. Logic **3**, 185–193 (2017)

[10] Boole, G.: An Investigation of the Laws of Thought on Which are Founded the Mathematical Theories of Logic and Probabilities. MacMillan, London (1854)

[11] Bréal, M.: Essai de sémantique, science des significations. Hachette, Paris (1897)

[12] Carnap, R.: Logical Foundations of the Unity of Science. International Encyclopedia of Unified Science, vol. I, pp. 42–62. University of Chicago Press, Chicago (1938)

[13] Carnap, R.: Intellectual autobiography. In: Schlipp, A. (ed.) The Philosophy of Rudolf Carnap. Open Court, LaSalle (1963)

[14] Corcoran, J.: The inseparability of logic and ethics. Free Inquiry **9**, 37–40 (1989)

[15] Couturat, L., Leau, L.: Histoire de la langue universelle. Hachette, Paris (1903)

[16] Garrido, A., Wybraniec-Skardowska, U. (eds.): The Lvov–Warsaw School, Past and Present. Birkäuser, Basel (2018)

[17] Genesereth, M.: Stanford Introduction to Logic—An Online Course on Symbolic Logic. University of Stanford, Stanford (2012–2019)

[18] Henkin, L., Suppes, P., Tarski, A. (eds.): The Axiomatic Method with Special Reference to Geometry and Physics—Proceedings of an International Symposium Held at the University of California, Berkeley, 26 Dec 1957–4 Jan 1958. North-Holland, Amsterdam (1959)

[19] Jaspers, D.: Logic and colour. Log. Univers. **6**, 227–248 (2012)

[20] Kalmus, P.: A climate scientist who decided not to fly, YES! Magazine (2016)

[21] Max, I.: A molecular logic of chords and their internal harmony. Log. Univers. **12**, 239–269 (2018)

[22] Moktefi, A., Shin, S.-J. (eds.): Visual Reasoning with Diagrams. Birkäuser, Basel (2013)

[23] National Day Calendar, National Dress Up your Pet Day. https://nationaldaycalendar.com/national-dress-up-your-pet-day-january-14/

[24] Piaget, J.: Recherche. Edition de la Concorde, Lausanne (1918)

[25] Singer, P.: Animal Liberation. HarperCollins, New York (1975)

[26] Smullyan, R.: Languages in which self reference is possible. J. Symb. Logic **22**, 55–67 (1957)

[27] Smullyan, R.: Gödel's incompleteness theorems. In: Goble, L. (ed.) The Blackwell Guide to Philosophical Logic. Blackwell, Oxford (2001)

[28] Smullyan, R.: Reflections—The Magic, Music and Mathematics of Raymond Smullyan. World Scientific, Singapore (2015)

[29] Symons, J., Pombo, O., Torres, J.M. (eds.): Otto Neurath and the Unity of Science. Springer, Dordrecht (2011)

[30] Tarski, A.: Lectures at UNICAMP in 1975, edited by L. Suguitani, J.P. Viana and I.M.L. D'Ottaviano. Editora UNICAMP, Campinas (2016)

[31] United Nations, International Days. http://www.un.org/en/sections/observances/international-days/

[32] United Nations, World Statistics Day, Resolution adopted by the General Assembly on 3 June 2015. http://undocs.org/A/RES/64/267

[33] Woodger, J.H.: The Axiomatic Method in Biology. Cambridge University Press, Cambridge (1937)

Jean-Yves Beziau
UFRJ - University of Brazil, Rio de Janeiro
Rio de Janeiro
Brazil
e-mail: jyb@ufrj.br
URL: http://www.jyb-logic.org

and

CNPq - Brazilian Research Council
Brasília
Brazil

and

ABF - Brazilian Academy of Philosophy
Rio de Janeiro
Brazil