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## INTRODUCTION: 10TH BIRTHDAY SPECIAL ISSUE OF THE JOURNAL OF LOGIC PROGRAMMING

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Volume 1, Number 1 of the *Journal of Logic Programming* appeared in June 1984, rather later than I had hoped. As of the time of this writing (May 1993), the latest issue is Volume 16, Numbers 1 and 2. The issue in which these words appear is a special one in celebration of the Journal's tenth birthday. It is thus a sort of birthday party, and I am delighted to have been asked to start the party off with a sort of toast.

The idea of starting a journal for our field was first suggested in Marseille on 13 May 1982,<sup>1</sup> during the final meeting of the Program Committee of the First International Logic Programming Conference.<sup>2</sup> In September 1982, I discussed the idea with many others who had come to Marseille for the conference itself, including Koichi Furukawa and several other Japanese colleagues. Everyone I spoke to felt that the time had certainly come to start an international scientific journal devoted exclusively to the subject of logic programming. There emerged an informal consensus that I should take on the task of making it happen and of acting as its first editor.

During the Marseille conference, Dr. Furukawa gave a fascinating presentation in which he described Japan's exciting program for the Fifth Generation Project, which had on 14 April 1982 officially established its Institute for New Generation Computing (ICOT) in Tokyo to begin ten years of intense logic programming research and development.<sup>3</sup> I had the pleasure of visiting ICOT for three weeks in January and February of 1983. This gave me the opportunity to discuss further the idea of a logic programming journal with Dr. Furukawa, Dr. Fuchi, and the late

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<sup>1</sup> By a happy coincidence I am writing these words on 13 May 1993, exactly 11 years later.

<sup>2</sup> The members of the Program Committee were Alain Colmerauer, Philippe Roussel, and Hervé Gallaire from France, Robert Kowalski and Keith Clark from the UK, Maurice Bruynooghe from Belgium, Maarten van Emden from Canada, Luis Pereira from Portugal, Peter Szeredi from Hungary, and Kenneth Bowen and myself from the USA. Alain Colmerauer was Chairman of the Committee and our excellent host.

<sup>3</sup> In April 1992 the project was extended for two more years.

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Professor Moto-oka. All three gentlemen kindly agreed to serve on the Editorial Board of such a journal and warmly welcomed the idea of its first appearance at about the same time as ICOT's own new English-language journals, *New Generation Computing* and the *ICOT Journal*. Thus at the beginning of 1983 it looked as if by year's end there would be no fewer than three international journals dealing in complementary and mutually supportive ways with logic programming research, and ICOT's two journals did indeed begin appearing before 1983 was over.

By early summer of 1983, thirty-three other logic programming researchers from all over the world had agreed to join Professor Moto-oka, Dr. Fuchi, and Dr. Furukawa on the Editorial Board, and I had managed to negotiate a satisfactory agreement with a publisher, Elsevier North-Holland, to manufacture, advertise, and distribute the journal. Announcements of its birth were sent out, with an invitation to researchers to submit papers.

In the end, just about one year more was to pass by before subscribers received the first issue. It seemed like a long time to me, and still does, but I am told that it was about par for the course. It would probably have been even longer but for the immensely helpful support and fruitful cooperation that I received from the Editorial Board and the practical wisdom, experience, and generosity of Alan Corneretto of the Elsevier Science Publishing Company.

At the end of a meeting in early 1984 with Mr. Corneretto and his expert staff in New York City, I was asked to suggest a characteristic symbolic motif for the design of the journal's cover. Was there some icon, glyph, or logo that could both catch the eye and serve to represent the essence of logic programming? That seemed like a tall order. All I could think of, on the spur of the moment, was the left-pointing arrow symbol  $\leftarrow$ . Robert Kowalski's refreshingly left-to-right version of Hilbert and Ackerman's long-established right-to-left notation  $\rightarrow$  for the "if-then" relation between the antecedent and the conclusion of a conditional sentence connoted for me a provocative, stimulating, and challenging new departure in applied logic. Whichever way it points, the conditional arrow, in general, has a dynamic aura, a feeling of movement, of purposiveness, but even more, if a conditional sentence is written in the Kowalski manner, it presents (when read in the normal way from left to right) the conclusion first, before one even meets the antecedent. Thus  $\leftarrow$  also suggests the "top-down" style of reasoning, in which one's deductive search pushes "backward" against the flow of the arrows, passing from a collection of desired conclusions to the various premises sufficient to deduce them, which then replace those conclusions in the waiting set. I thought that these associations of ideas more or less added up to an image—perhaps only a subconscious one—of the essence of logic programming. The traditional blunt-looking horseshoe symbol  $\supset$ , introduced by Peano and used by Russell and Whitehead, Church, Quine, and many other logicians for the "if-then" sign, did not seem to be to carry this sharp sense of a directed flow of reasoning.<sup>4</sup> It looks like a club or the front of a railroad locomotive. Two other candidates, the familiar "turnstile" deducibility symbols, with the single crossbar  $\vdash$  for syntactic derivability and the double crossbar  $\models$  for semantic entailment, were already in use as part

<sup>4</sup> I must confess that I am somewhat baffled by the survival, and indeed the widespread and apparently permanent adoption by Prolog users, of Edinburgh Prolog's stop-gap convention, *faute de mieux*, of the colon followed by a hyphen. Far from being a second-best substitute for the arrow, it seems, at least in the trenches, to have replaced it!

of the ingenious and elegant equational logo  $\models \equiv \vdash$  which asserts so neatly and compactly the soundness and completeness of first order logic. This masterly glyph had already been invented by the members of the Lisbon group for the masthead of their *Logic Programming Newsletter*, which first appeared in 1981, and I did not think it right to trespass. So  $\leftarrow$  was it.

The designers next requested that I suggest two “logically meaningful” colors for the two-color cover. This also was a tough one. Logic seems too abstract to be much involved with colors—it is a “black and white” science, is it not? All that came to mind for a few moments was Rudolf Carnap’s intriguing but unpublished idea from the early 1930s (told to me by Arthur Pap, his student and my teacher, in 1952) to introduce colors as official attributes of symbols in the logical syntax of his formal languages: black for the object language, red for the metalanguage, green for the meta-metalanguage, and so forth. Carnap never did follow up this possibility, and I could not think, half a century later, of how to make use of it for our cover design. So, again on the spur of the moment, I suggested the two traditional shades of blue associated with Oxford and Cambridge Universities. My rationale, such as it was, was that we should use Cambridge’s light blue for coloring the arrow on the grounds that Cambridge epitomizes the “modern logic” of the twentieth century. Bertrand Russell, Alfred North Whitehead, not to mention Alan Turing and Ludwig Wittgenstein, were all Cambridge men. (I must admit, too, that I was once a student there myself.) So that is the reason why our cover is emblazoned with a Cambridge-blue left-pointing logic-programming arrow shooting off into the future, as it were. The artist had the happy inspiration to paint the arrow with loose brush strokes so as to obtain a kind of jet-engine-condensation-trail or rocket-drive-plume effect. It stands out beautifully against the “deep space” background of Oxford’s cold and inscrutable dark blue. Oxford is the ancient home of Aristotelian and medieval logic, associated with such names as Robert Grosseteste, Roger Bacon, and William of Ockham. Well, anyhow, the Elsevier artists were exceedingly busy people and needed to come up with a cover design in a hurry, so there was no time to ponder anything better. If it were well ’tis done, ’twere well it were done quickly. So, ’twas. Their striking cover has now appeared 47 times. Looking at it, you can almost hear the roar of logic programming’s takeoff into the far yonder. So far, nobody has to my knowledge objected to the design, and I hasten to add that of course Oxford is nowadays an outstanding center of modern logical studies.

As informal “founding” editor, I thought of myself from the start as doing only a temporary, catch-as-catch-can holding duty until some more appropriate person could take over. Unfortunately it was to take two and a half years, and nine issues, before this happened. I was relieved, and delighted, to hand over the reins to the expert, scholarly, indefatigable care of Jean-Louis Lassez, who was to guide the Journal superbly from July 1986 until January 1991. Under his editorship, the JLP left its initial two startup years far behind and soared into a splendid half-decade of flourishing growth, attaining a proud, active, healthy steady-state. One of his early innovations was to divide the broad field of logic programming into six subfields, each with its own special Area Editor: Implementation and Architecture (D. H. D. Warren), Language and System Design (E. Y. Shapiro), Theory (J. W. Lloyd), Databases (H. Gallaire), Natural and Formal Languages (F. Pereira), and Knowledge Representation, Reasoning and Expert Systems (K. Kahn). Though the Area Editors have changed, these same subfields are still in use in the current issue

(May 1993).<sup>5</sup> Despite the heavy burden of carrying on his own active and distinguished research program and at the same time managing a large theoretical group at IBM's T. J. Watson Research Center, Jean-Louis served the Journal brilliantly and with great devotion for the next 25 issues. Everyone in the international logic programming community owes him an immense debt of gratitude.

The present Editor, Maurice Bruynooghe, took over from Jean-Louis Lassez in January 1991. The journal is thus entering its second decade in excellent hands and in fine shape. I wish Maurice and his Area Editors every success, and I am completely confident that he and they will continue to meet the high standards set by Jean-Louis.

The field of logic programming has become a well-established part of computer science and continues to attract more than its share of clever and creative young people. There is much yet to do, there are many questions to answer, and the subject is becoming more difficult and complex every year. All over the world, nevertheless, there are researchers who have fiercely dedicated themselves to the challenge. As the articles in this special tenth birthday issue attest, our young field enjoys a wealth of talent that is second to none over the whole gamut of computer science. Indeed, the broad expanse of logic programming, in general, seems to me to cover the entire reach of computer science, but in a special way that puts logic (both pure and applied, both theoretical and practical) always at the center of the picture. This has been its strength, and it is the explanation for its success and its popularity. It is pleasant to recall Carl Hewitt's gentlemanly observation: "Prolog is Planner done right." I would go further and say: "Logic programming is computer science done right." The ever-increasing army of logic programming researchers clearly would agree with this.

The *Journal of Logic programming* is one of the major visible manifestations of this admirable, important, and exciting worldwide research effort. It is a great pleasure to have been invited to give this little toast on the joyful occasion of its tenth birthday. Good health and long life to this Journal and all its guardians and contributors. Now let the feast proper begin . . . .

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<sup>5</sup> Meanwhile, the latter area has been renamed into *Programming Methodology and Applications*.