15th July 1972: A Significant Moment for Logic Programming

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Between the 14th and 16th of July 1972, a secret meeting of the founders of the burgeoning field of Logic Programming (LP) was held at the University of Rutland, a secluded grove of academia in the scenic North West of England. The Saturday afternoon was decisive for LP; if events had taken another turning, our field would have been very different.

At the end of the 1960's and at the beginning of the 1970's there were many negative comments made, especially from the direction of Cambridge, Massachusetts, to the effect that doing AI computing by logic, and especially by resolution, was an extremely silly thing to do [11]. The logic programming part of the AI school at Edinburgh University, consisting of Robert Kowalski, Donald Kuehner, Robert Boyer, J Moore, David Warren, Maarten Van Emden and many others, felt that they were in the midst of a maelstrom. The fashion had turned against uniform, general-purpose theorem provers toward the procedural representation of knowledge and domain-specific problem solvers. They battled on, feeling increasingly isolated from the AI community [7].

This brave group took solace in the fact that there was another pocket of sanity in an increasingly crazy world: the AI group at the Université d'Aix Marseilles. Alain Colmerauer, recently made a professor, had drawn together Phillipe Roussel, Robert Pasero and others into an effective research entity. Driven by Robinson's paper on resolution and unification [10], they had established contact with Kowalski, whose work with Kuehner on SL-resolution held a gold mine of useful theoretical results [8]. The main concern of the Marseilles group in earlier 1972 still remained the development of a man-machine interactive system capable of making deductions from a set of natural language sen-

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†Dick Wexelblat had the courage to print this paper in the April 1st, 1993 issue of *SIGPLAN Notices*. It was quickly supressed by the Logic Programming 'powers-that-be'.

tences [2]. To aid this goal, Roussel and Colmerauer had designed and written a new interpreter in Algol-W based on Roussel's earlier SL-resolution theorem prover [12]. At this time (Summer 1972), they had not yet decided on a name for the interpreter. Teaming up with Pasero, they had used the interpreter to implement a large natural language system, consisting of hundreds of clauses [3].

For the Edinburgh team there was a very pressing problem – money. Kowalski was hoping to obtain a NATO research grant in order to further nurture the French connection, but a major piece of bad luck had occurred – Curtis Clump, probably the most virulent US critic of resolution, had been assigned as the grant referee. There seemed little chance of receiving any funding. In a hurried international phone conversation, Kowalski and Colmerauer agreed to meet (along with other key members from the two groups) in order to plan how to have Clump removed. Everyone agreed that Alan Robinson was the ideal choice to replace him. Due to the nature of the meeting, it was decided to keep it as secret as possible. This led to the proposal to hold it at Rutland University, only 30 minutes drive from Manchester Airport but conveniently far away from Edinburgh and Marseilles. The date was set for the weekend of the 14th to the 16th of July.

Initially, the *Rutland Summit* (as it was later known) went extremely well. Boyer and Moore were there with their Baroque assembly-like programming language [9]. It provided list processing and arithmetic primitives defined by Horn clauses, and even had 'demons'. Of most interest to Roussel was its use of a structure sharing SL-resolution theorem prover with a depth-first search strategy [1]. Back in Marseilles later in 1972, two of his students, H. Melloni and G. Battini, implemented a Fortran version of the French interpreter using structure sharing [13]. David Warren was also at Rutland, at that time still programming with non-Horn clauses. Later, he became more interested in language implementation after seeing the Fortran interpreter in action at Marseille. Even Van Emden was there, primarily to continue the discussion with Kowalski about the relationship between Scott's fixed point semantics of recursive programs, Tarskian semantics and proof theory of first-order logic [15].

In truth, Kowalski was slightly disinterested in Colmerauer's interpreter; he found it hard to accept its incomplete depth-first, backtracking search strategy. With his theorem proving background, he also found it hard to be enthusiastic about its sequential execution of procedure calls. He hoped it might be possible to base a more powerful LP system on the use of coroutining in Lush (*Linear resolution with Unrestricted Selection for Horn clauses*) or on the connection graph proof procedure [5]. However, when pushed he had to admit that the interpreter was a practical reality whereas at the time Lush and connection graphs were not.

Kowalski was heavily overworked as usual – he was putting the finishing touches to a paper he was going to present at a conference in Jablonna in August [4]. He was also working on a draft of his 'Logic for Problem Solving' text, which would take another two years to complete [6]. He had still to decide on his recommendations for Roussel's thesis [12] for which he was an external examiner. This was all to turn out well – Roussel's impressive use of equality axioms led Kowalski to overcome some of his revulsion for programming, computers and recursion theory, and write some small recursive predicates for addition and factorial.

On Saturday afternoon, Kowalski, Colmerauer and the other researchers reluctantly put aside their technical discussions, and the two groups began to address the removal of Clump as referee. Kowalski always felt uneasy about Clump because of a disagreement (many years before) they'd had in the tea room of the Maths Department at Edinburgh over the origin of frisbees. Some of the younger members of the meeting humorously referred to 'Clump's impeachment', little knowing that Nixon would be gone from the White House within a month.

As the summit progressed, the discussion moved onto the subject of a name for the Marseilles system. Some of the French liked 'PALGOL' – *PArLe en LOGique* (read LOGique backwards). This name reflected the system's implementation in Algol-W, while being the complete opposite of the discredited imperative paradigm. Some of the Edinburgh contingent suggested 'COMMODE', based on the phrase '*COMputation MOdelled on DEduction*'. This was eventually dumped along with PALGOL. A few hours passed with only 'SLOP' (*SL-resolution theOrem Prover*) being briefly considered and then rejected.

Things were going nowhere, and it was decided to stop for the day. It was still quite early, and Kowalski suggested that Colmerauer and Roussel might care to join him for a short stroll through the pleasant countryside. It was agreed and, together with Roussel's wife Jacqueline, they headed towards Rutland Wood, a well-known beauty spot and place of tranquillity. They were surprised to find that it was anything but quiet – tree felling on the north side of the wood had begun the preceding week and the local wildlife society were holding a demonstration. It was sparsely attended, although there was a photographer present from the local newspaper, the *Rutland Gazette*. An elaborate photo session was being prepared as Kowalski, Colmerauer, Roussel and his wife arrived; the leaders of the demo were holding up a long banner for the camera. The only problem was the lack of people and soon the LP party found themselves included in the photo. It was only then that Jacqueline Roussel pointed to the words on the banner: 'Save Rutland Wood: The Wildlife Society is Pro-Log'. At that moment, `Prolog` was born, and a picture in the Wednesday 19th July 1972 issue of the *Rutland Gazette* proves it [14].

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