

WHAT RUSSELL LEARNED FROM PEANO

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On a quiz in a "Study of the History of Mathematics" course, the question was asked: "When Russell met Peano, what language did they speak to one another?" One student answered "symbolic logic." The student was clever, but wrong—and not just wrong: he had missed completely the historical importance of that meeting, for it was precisely symbolic logic that Russell learned as a result of meeting Peano, and he learned it from Peano. The evidence comes from Russell himself in, among other places, the description of the International Congress of Philosophy in Paris, 1900, in his *Autobiography* ([21], p. 217-219):

The Congress was a turning point in my intellectual life, because I there met Peano. I already knew him by name and had seen some of his work, but had not taken the trouble to master his notation. In discussions at the Congress I observed that he was more precise than anyone else, and that he invariably got the better of any argument upon which he embarked. As the days went by, I decided that this must be owing to his mathematical logic. I therefore got him to give me all his works, and as soon as the Congress was over I retired to Fernhurst to study quietly every word written by him and his disciples. It became clear to me that his notation afforded an instrument of logical analysis such as I had been seeking for years, and that by studying him I was acquiring a new powerful technique for the work that I had long wanted to do.

But what, specifically, did Russell learn from Peano? According to Russell, the enlightenment he received came mainly from two purely technical advances. (He notes, by the way, that: "Both these advances had been made at an earlier date by Frege, but I doubt whether Peano knew this, and I did not know it until somewhat later." ([20], p. 66). "The first advance consisted in separating propositions of the form 'Socrates is mortal' from propositions of the form 'All Greeks are mortal'." [20, p. 66]. In the symbolism of Peano, adopted by Russell, this distinction is between $s \in M$ and $x \in G \supset_x x \in M$. "The second important advance I learnt from Peano was that a class consisting of one member is not identical with that one member." [20, p. 67]. That is, $s \in M$ is not the same as $s \subset M$.