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THE DEVELOPMENT OF LEWIS' THEORY OF STRICT IMPLICATION

E. M. CURLEY

In an autobiographical article published in 1930, C. I. Lewis described his first contact with Russell and Whitehead's *Principia Mathematica*. After remarking that Josiah Royce had been, of his teachers at Harvard, the one who had exercised the greatest influence on him, Lewis went on to say that

> Royce was also responsible for my interest in logic, or at least for the direction which it took. In 1910-11 I was his assistant in two courses in that subject, and he put into my hands one of the first copies of *Principia Mathematica*, volume i, which came to Cambridge. It is difficult now to appreciate what a novelty this work then was to all of us. Its logistic method was so decidedly an advance upon Schröder and Peano. The principles of mathematics were here deduced from definitions alone, without other assumptions than those of logic. I spent the better part of a year on it.
>
> However, I was troubled from the first by the presence in the logic of *Principia* of the theorems peculiar to material implication . . . [1]

This dissatisfaction with the logical calculus that formed the foundation of *Principia* eventually produced the Lewis systems of strict implication, and with them, modern modal logic.

The theorems "peculiar to material implication" were, as Lewis never tired of pointing out, very numerous indeed. There were the well-known ones:

$$2.02 \qquad q \supset (p \supset q)$$
$$2.21 \qquad -p \supset (p \supset q)$$

which Russell and Whitehead read as "a true proposition is implied by any proposition" and "a false proposition implies any proposition."[2] But there were also many others, not so well-known, which followed equally from the axioms, definitions, and rules of the system, e.g.:

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