

The 1911 EGs are Peirce's last and best version

[This is an excerpt from a planned update to <http://jfsowa.com/peirce/eg1911.pdf>]

The version of existential graphs that Peirce presented in L231 (published in NEM 3:162 to 169) is the clearest and most general version of Alpha and Beta EGs. All earlier versions, their primitives, their rules of inference, and their semantics (endoporeutic) can be defined in terms of the 1911 version. Although earlier MSS contain important examples and insights, every EG feature is explained more clearly and precisely in the 1911 version.

The transition from the 1906 version of EGs to the 1911 version is documented in five MSS: R669 (May 25 to June 2) is based on the 1906 version, but R670 (June 7 to 17) begins with different primitives, notation, and specifications. L231 (June 22) is the best available presentation of the 1911 version, and two later MsS, L378 (September 29) and L376 (December 9), are based on it.

On 2 June 2011, while he was working on R669, Peirce stopped after writing two *illative permissions* (rules of inference), and he did not use the adjective *illative* for the rule of double negation. Five days later, he began R670 with the same title, but with a summary of the new version. On June 22, he wrote a complete specification in L231. In the new version, he presented all three permissions, but without the word *illative*. He apparently realized that the rules of inference depend only on negations. They do not require a special *sign of illation*, such as the EG scroll.

L378 and L376 confirm the fact that R670 is a rejection of R669 and the 1906 version of EGs on which it is based. In L378, Peirce confirmed that point: "I use a diagrammatic syntax, which I described very badly and at an intolerable length in the *Monist* of October 1906." In L376, he was more explicit: "For although the system itself is marked by extreme simplicity, the description fills 55 pages, and defines over a hundred technical terms applying to it. The necessity for these was chiefly due to the lines called *cuts* which simply appear in the present description as the boundaries of shadings, or shaded parts of the sheet."

As an example of the complexity, Peirce stated 11 rules of inference in 1906 (CP 4.417), but all those rules are special cases of the three pairs of rules in 1911. As another example, one sentence in 1911 "we shade that assertion which we deny as a whole" (NEM 3:163) is equivalent to a long, convoluted explanation in 1906: "The filling up of any entire area with whatever writing material (ink, chalk, etc.) may be used shall be termed *obliterating* that area, and shall be understood to be an expression of the pseudograph on that area. *Corollary*. Since an obliterated area may be made indefinitely small, a single cut will have the effect of denying the entire graph in its area. For to say that if a given proposition is true, everything is true, is equivalent to denying that proposition" (CP 4.402).

Although L231 does not discuss extensions beyond FOL, L376 refers to a new method for representing modality: "I shall now have to add a *Delta* part in order to deal with modals." No MS that describes Delta graphs has yet been found, but R670 includes some comments about adding modal features to the 1911 EGs.

In L231, Peirce reduced the jargon to a minimum by avoiding the words *cut*, *sep*, *dot*, *spot*, *recto*, *verso*, and *scroll*, which refer to features on a two-dimensional sheet of paper. Unlike the two-dimensional cut, the shaded areas for negation can be generalized to shaded segments of a one-dimensional line or closed regions in any dimension. In the same MS, Peirce regretted a lack of funds for processing and reasoning with "stereoscopic moving images" (NEM 3.191). That comment suggests new directions he had hoped to explore.