Anna Klein geb. Hegel

Felix Christian Klein

Hochzeitsbilder 1875

If we observe self-similarity between doing math and making findings—i.e. how math is demonstrable by its applications and findings are discoverable through a mathematical principle—how can we elaborate the relationship between math and findings as a holistic one, without resorting to dialectics?

It is if we can find/establish an intermediary without which there is no similarity nor connection, and conceive such a *media* as a mathematical-empirical *vector*. That is, an entity which *neither* belongs entirely to mathematical nor empirical research, *nor* is completely included in language.

That is, a special entity which is composite as a vector: outside the laws of composition of mathematics, but within the possibilities of artistic composition. A geometer is here both a surveyor and a mathematician. Art here operates in the expanded field of geometry (as in the history of drawing).
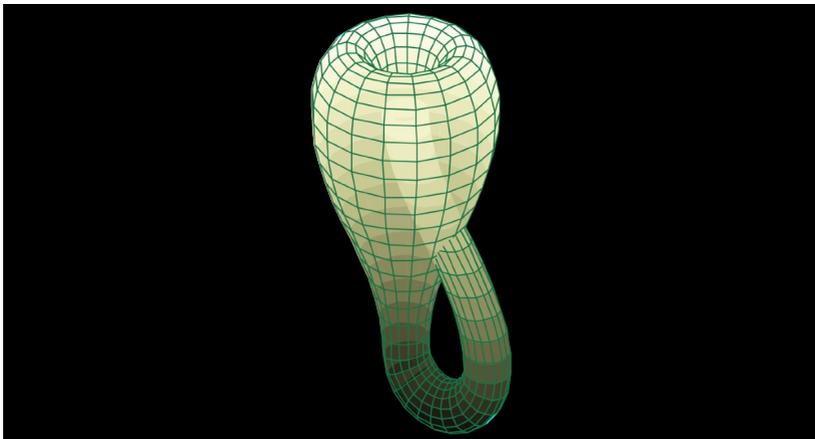
The idea that a single mediating entity both allows to *narrow* and *expand* a *record* of findings, is not only what allows discovery (by narrowing) and demonstration (by expanding), but also establishes the principle of *self-similarity* on different grounds: featuring the entity as a second order finding.

By mediating between the narrowed and expanded extensions of the record the mediating entity operates as a *mirror*: whereby self-similarity is established between the discoveries (research) and demonstrations (application) from the record. The mirror thereby lacks mathematical/empirical purity.

It is empirical (found) and mathematical (conceived) at the same time, in a way that resonates with Spinoza's attributes: thought and extension. If so, we are challenged to consider mirrors, in the above sense, as clones of substance: a *vector*—imaginably—obtained by pairing math with findings.

For instance, I *discovered* that Felix Klein—the man to whom we owe the notion of the special entity—was married to Hegel's granddaughter. On the other hand, I his interest in applying math to mechanics is a *demonstration* of his interest and devotion to establishing mathematics in education.

Obviously, neither of these things can be inferred from the theses laid out in the Erlangen Programme: his inaugural lecture as a professor in mathematics at the University of Erlangen at the age of 23. It is in this lecture that he lays of the role of *special entities* in expanding the properties of a group.

The Erlangen Programme is itself a case in point of a special entity, since a particularity of the lecture—according to the custom of the public *exposé* at the time—is that it contains *no* mathematical formulae. Which, of course, testified to the applicability/validity of the thesis beyond mathematics.

Currently, the dialectics of math and prose is topical in the area of [text and data-mining.](#) The technological focus on algorithm in this query may lock the search within this principal focus, neither moving within nor beyond it. Which suggests that Klein's notion of the programme was non-dialectical.

And that it instead was *complex*. Is it possible to marry Hegel's grand daughter without becoming involved in dialectics? Yes, if you allow for a complex relation between mathematical and empirical research: *discovering* dialectics—as it were—in a joint mathematical and empirical query.

Is it possible to become involved in the application of mathematics in the field of mechanics running clear of dialectics (as a possibility rather than a necessity)? Yes, if the successful application to mechanics serves to *demonstrate* the math, and makes a point of their *complex* relationship.

The mirror—as conceived here—does not convey a pre-existing similarity, but creates it: the mirror creates a match that brings up self-similarity. Hence we must conceive self-similarity as a creative principle. A creative principle of nature into which humans may be more or less involved.