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UFD0014  Anne-Françoise Schmid

The Madonna on the Craters of the Moon: An Aesthetic Epistemology

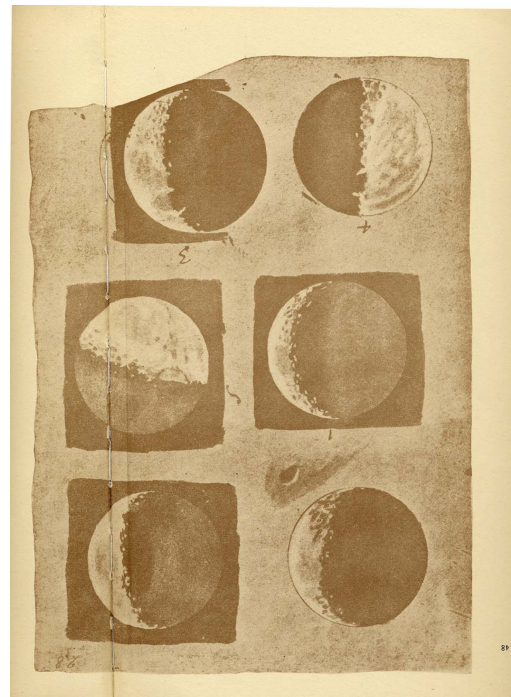
Anne-Françoise Schmid introduces the enterprise of non-standard or generic epistemology by way of the relation between science and art

Introduction: Mannerism as Link Between Science and Art

2013 was the centenary year of the death of Lodovico Cardi di Cigoli (1559–1613). A friend of Galileo, a painter and architect, inventor of a ‘perspectograph’, this artist contributed to synthesizing the relations between science and religion. In the Church of Santa Maria Maggiore in the Trastevere district of Rome, he painted a fresco representing the Madonna or the ‘woman of the apocalypse’ from chapter 12 of the Book of Revelations:

A great sign appeared in heaven: a woman clothed with the sun, with the moon under her feet and a crown of twelve stars on her head. She was pregnant and cried out in pain as she was about to give birth.

Cigoli’s Madonna stands upon a moon similar to that in Galileo’s drawings in *Sidereus Nuncius*, thus bringing an object of contemporary science into a painting designed for religious adoration.



We might say that this fresco brings into relation two contrasting objects: one expressive, a representation of belief and tradition; the other testimony to the then current state of science, showing it as such, frozen in time. In particular, there is a contrast between the images of the other celestial bodies—the twelve stars that crown the virgin, a sun that is at once her alcove and a source of light—and the Moon as science saw it. We postulate a movement between the two through the movement of the fabric of the Madonna's clothing, which permits an exchange between spiritual life and the real of the sciences, passages between expression, representation, and knowledge.

To celebrate the centenary of Cigoli, our hypothesis consists in reflecting upon these contrasts and their relations with each other. In the Cigoli fresco, the objects are given, either by tradition or by current science; they are heterogeneous, but relations are expressed between these two objects. It is not simply a question of exhibiting knowledge, but also one's relation to it, and the stances taken in relation to the concept and the sensible alike. It is the two-fold relation, a relation to the content of knowledge and to intimacy, that one might call mannerism, a mannerism that has been attributed to Cigoli's pictorial work. What we will seek to show is that this mannerism is a kind of relation between arts and sciences, when objects are given: Galileo's moon, the Madonna of the Apocalypse. One might also invoke the idea of the baroque, as developed by Deleuze in relation to Leibniz in *The Fold*.¹

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Our text proposes a reinterpretation of mannerism in terms of the relations between science and art, and demonstrates what consequences this holds for the contemporary sciences. In order to do so, we must return to the question of the object, the object of science and the object of art, a given object and an object that is not given; which will then bring us back to the perspectograph, an instrument of which

Cigoli invented a new form: a movement from the given object to its perspective, or, on the contrary, from the schema projected on the basis of the given to the invention of new objects, but in a different sense of the word 'object'.

From the Object to the Relation to the Object

In the relation between art and sciences, we therefore think that the question of the object and that of the relation to the object must be treated together. We are dealing with a couplet involving both O and the relation to O, and which we can treat as a perspective on O or a model of O, depending on whether we adopt the scientific or the aesthetic stance.

Objects can no longer be defined in terms of their totality, but instead must be defined in terms of their multidimensionality

From the point of view of art, this question is broached in Umberto Eco's work *The Open Work*.² Eco distinguishes between given objects and open objects, whose identity must be expanded. He shows how objects can no longer be defined in terms of their totality, but instead must be defined in terms of their multidimensionality—which is not just a matter of context, but of the object itself. Eco mentions musical compositions, in particular Stockhausen's *Klavierstücke XI*, a piece whose author is well-identified, but which is open to interpretations that are not given, since the chosen order of the motifs is not the work of the composer, but of whoever performs the work. The work is therefore complete, but open; and thus passes into a new mode of identity. A work of Mozart's, on the contrary, may allow different expressive moods depending on the interpreter, but as a work it will always remain self-similar. The structure of the piece is not open to interpretation.

Even in the open work, though, Eco sees no direct relation between sciences and arts through the object or through the relation to the object. His hypothesis is that here what is needed is an 'epistemological metaphor':

1. G. Deleuze, *The Fold: Leibniz and the Baroque*, tr. T. Conley (Minneapolis, MN: Minneapolis University Press, 1992).

2. U. Eco, *The Open Work*, tr. A. Cancogni (Cambridge, MA: Harvard University Press, 1989).

But if an aesthetic form cannot be substituted for scientific knowledge, one might however see in it an epistemological metaphor: in every century, the way that artistic forms are structured reflects in a broad sense, via similitude, metaphor, resolution of the concept into a figure, the way in which science or contemporary culture views reality.³

We propose to move from this epistemological metaphor to an aesthetic metaphor. From the metaphor of faith, transposed into the heavens, and the moon object as synonym for science, as in *Sidereus Nuncius*. According to Eco, in the open work the two do not overlap at all, and the metaphor is just a complement to knowledge.

Construction of Relations between Science and Art: From the Open Work to an Open Science

Within the multiple and interdisciplinary regimes of contemporary science, one can no longer postulate a direct relation between epistemology and the sciences—just as Eco sees that there is no direct relation between science and art. Such a relation would suppose that a particular example of science could stand as the paradigm of science as such: mechanics for physics, physics for chemistry, biology for the human sciences. This approach is inadequate for the contemporary sciences; instead we must admit indirect relations between sciences and epistemologies, and must envisage a plurality of epistemologies. Science is no longer given as a known object; it is no longer given as in Galilean mechanics, where an astronomical object appears through an instrument. The science-object is an object 'X' that must be invented or designed, taking account of what we see through our instruments. To take up Eco's metaphor, science thus becomes an open work; and it is generic epistemology, which does not depend on any one particular discipline, that allows us to construct the means to understand, indirectly and partially, this science-object.

This does not mean that arts and sciences are directly mixed and entangled with each other; Eco's

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prudence on this question still stands. But on the other hand we must, in the space of the contemporary, construct intermediaries. Generic epistemology is a sort of intermediary between science and philosophy. In the same way, we propose aesthetics as an intermediary between science and art. Art is no longer a complement to knowledge, but an inchoate condition, a partial orientation, a recognition-without-concept of non-convergence, and an experiment in inventive thinking which no longer treats objects as given and known.

From Epistemological Metaphor to Generic Epistemology

The conditions of the passage between Eco's epistemological metaphor and aesthetic epistemology presupposes the conceptual structure of generic epistemology, which is relatively independent of all disciplines but respects them, 'processes' them (none of them is dominant), and practices a democracy of disciplines (each has the same weight, none can claim to be more important than others—for example, GMO products cannot be regarded as products of molecular biology alone), a collective intimacy (taking account not only of objects, but of the intimate relation to objects) which, in the case of art, we treat as a contemporary form of mannerism, and ultimately as a work that sets up a matrix between heterogeneous components (sciences and philosophy, or art and science) which are nonetheless oriented and dynamic, as in François Laruelle's non-standard philosophy.⁴

These features of generic epistemology are far from trivial, for they displace the oppositions and continuities between theories and facts as classical epistemology thought them. We are no longer within a theory or a discipline, we are in a space that does

3. Eco, *La poétique de l'oeuvre ouverte* (Paris: Seuil, 1965) [Back-translated from French version—the English translation differs—trans.].

4. F. Laruelle, *Introduction aux sciences génériques* (Paris: Pétra, 2008) and *Philosophie non-standard: générique, quantitative, philo-fiction* (Paris: Kimé, 2010).

not depend directly on any of them, but which guarantees for them the coherence and compatibility of that which is constructed within this generic space which works with fragments of sciences, theories, and disciplines. Disciplines are convened by a subtractive discipline, a so-called 'discipline+1' which articulates the relations between disciplines. It does not overdetermine them, but underdetermines them. We might choose epistemology as such a discipline, so as to understand the new objects of science; or aesthetics, to interpret the inchoate forms of series of givens. But any discipline whatsoever can serve as a discipline+1. One might for example reread the works of Freud by choosing thermodynamics to bring together his metaphors, or understand philosophical multiplicities by underdetermining them through an essentially multidisciplinary biology. This way of understanding the sciences as being in superposition is not at all positivist: for the facts correlated with the theories thus isolated are reinterpreted in series of other fragments of theories.

Integrative Objects: A Hypothesis More Radical than Eco's

This way of working leads us to consider the new objects of science no longer as complex, but as 'integrative'. The complex object corresponds more or less to the stage of the open work, where the creation of a discipline of itself no longer allows us to apprehend the objects which it works with, but requires the interpretation of others. This state of affairs supposes the convergence of disciplinary perspectives upon partially-given objects—just as the *Klavierstücke* are always the work of Stockhausen, but only become audible through the intermediary of a performer who is not only implicitly the 'translator', but explicitly the 'composer-translator'.

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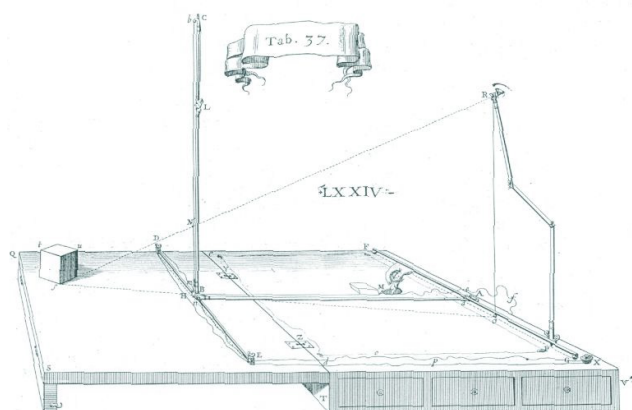
The 'new objects' have very different characteristics. They superimpose fragments of knowledges according to a discipline+1. They also comprise the non-knowledges of each discipline in relation to these objects: disciplinary non-knowledges which, by iteration, allow us to reformulate in each discipline

the knowledges that it masters and the non-knowledges that it constructs. The only unity these objects have, a partial and momentaneous unity, is that of the intentions of particular researchers, which never entirely encompass them as a whole. Ultimately these objects are no longer manipulable; they are not constructed in a phenomenological distance which separates the researcher from his or her object. They are radically non-synthesizable. Just as the concept of 'uncertainty' has passed from the margins of science into its heart, that of the non-synthesizable is beginning to afford a certain methodological access to created objects (GMOs, the product of nanotechnology, of synthetic biology, etc.) and objects of study (obesity, depression) which involve numerous disciplines and which do not converge. We need to invent scientific methods that will allow the construction of methods of invention within this non-synthesis.

We might say that already, in the Madonna on the craters of Cigoli's moon, we find a sort of non-synthesis between that which comes from religion and that which comes from Galilean science. Science is like a foreign body in the spiritual atmosphere of the painting and in its site (a church). And yet certain elements of the painting suggest ways in, such as the fabrics or the nuances of light, and the very 'painting' form itself as a completed work; or mannerism, interpreted not only as knowledge of the painted object, but as a relation to that object, the intention of the painter or spectator, allowing this synthesis to be recomposed. Our hypothesis is that current science cannot be completely reunified either by epistemology, nor art by aesthetics, understood as all-surveying modes of knowledge. We must take account of their heterogeneity, which is not reducible to one discipline or another. Epistemology places at our disposal various models of fragments of science, just as aesthetics provides us with models of the work of art. And their superposition brings out emergent elements.

The integrative object has been recognized on both the epistemological and the aesthetic plane. Robin Mackay has said that the integrative object allows one to differentiate between modern and contemporary art.⁵

5. R. Mackay, 'On Making Ready', in S. Starling, *Reprototypes, Triangulations and Road Tests* (Berlin, Sternberg Press, Thysen-Bornemisza Art Contemporary, 2012), 15–21. See also Introduction, and A.-F. Schmid 'On Contemporary Objects', in *Simulation, Exercise, Operations* (Falmouth: Urbanomic, 2015).



The Inversion of the Perspectograph (Armand Hatchuel)

The integrative object allows us to conjugate generic epistemology and aesthetics. One way of doing this is exemplified by what Armand Hatchuel has called the 'inversion of the perspectograph'.⁶ This idea inverts the notion of the open work, in the sense that no longer consists in showing that, from a closed or given work, one passes to the open work, as in a progress or a complexification. Instead, it is a matter of showing that the given work is a particular case among a number of 'X's to be invented. Rather than a perspectograph, where the image of a given object is drawn on a surface as a function of the rules of perspective, so that the painter can read it, we make use of the device in such a way that it is not the object that is the origin, but the image on the surface, like a generic sketch or a 'croquis' allowing for the projection of an infinite number of possible objects. It is not a matter of modeling the given object according to perspectives, but of designing, with the aid of a generic model, a multiplicity of objects. This supposes a new stance, where the stakes would no longer be those of modeling objects, but of designing them. In other words, we pass from an observed anomaly—an autonomous citation of Galileo in a painting of the assumption of the Madonna—to a desired anomaly, on the basis of the 'sketch' of their articulation or of their non-articulation or disarticulation.

6. A. Hatchuel, Y. Reich, P. le Masson, B. Weil, A. Kazakci, 'Beyond Models and Decision: Situating Design Through Generative Fictions', paper in the proceedings of the International Conference on Engineering Design, Seoul, August 2013.

....and its Consequences for Art

What is ordered by a certain perspective does not go without saying, as with Cigoli's perspectograph. Mathematician and painter Maurice Matieu sets out the relation between art and mathematics by saying that the difference between the properties of R (the set of real numbers) and of the powers of R is that R is ordered, whereas its powers are not.⁷ From this he concludes that painting begins with the powers of R . The pictorial work is thus understood as a resistance to order, and a creation that is 'piecemeal', proceeding piece by piece (as in analytical geometry), and not as the all-surveying view of a set inhabited by given objects. Rather than a totalizing painting, it is a matter of constructing a space determined by 'pieces', at once sensible and conceptual (the gesture of the painter), a struggle against an order to assist in the quest of that who does not see itself, or no longer sees itself, as a painting 'without' a canvas, for example like those of James Turrell which are inscribed into the very rock of a volcano. Thus neither order nor dimensions are given—they must be designed. This is yet another way, closer to the lived experience of the painter, of describing the destruction of the finished work and the given object. The painter's relation to the object is resistance to a given order and to given dimensions.

One example of an integrative object in art was Pierre Huyghes's exhibition at the Centre Pompidou in Paris (2013–2014), where each space, each piece, only made sense through its non-synthetic relation to others.⁸ Here there is apparently a given, but it is continually transformed and redesigned, if only by the presence and movement of the spectators who participate in the elaboration of a generic space.

...and its Consequences for Science

This 'inversion of the perspectograph' also makes sense as far as the sciences are concerned: the sciences are no longer content to describe that which is; they create objects. In doing so, science deals with many regimes and many scales at once, both disciplinary and nondisciplinary regimes.

7. M. Matieu, *Autobiographie par la forme* (Arles: Actes Sud, 2009), 34.

8. See E. Lavigne (ed), *Pierre Huyghes*, exhibition catalogue (Paris: Centre Pompidou, 2013).

Ingredients other than those foreseen by the classical correlation between fact and theory have to be integrated, along with the given data (which are not facts), modelization, and simulation. The articulation of these regimes supposes that, in science, we take into account not only the contents of different modes of knowledge, but also the relation to these modes of knowledge; it supposes that science also becomes, in its own way, mannerist, that it creates dimensions. According to the geographer Nicole Mathieu, it is not enough to place environment and aesthetics alongside each other in order to make sustainability; an angle, a non-continuity, must be constructed between them.⁹

Objects are no longer manipulable, visible in a phenomenological distance; on the contrary, they become a condition of visibility and are a condition of bifurcations and encounters

This idea can be manifested by bringing to light the heterogeneous disciplines and scales involved in 'contemporary objects'—involved in such a fashion that they are only visible through the non-positivist organization of a discipline+1, and are never completely synthesizable. Objects are no longer manipulable, visible in a phenomenological distance; on the contrary, they become a condition of visibility and are a condition of bifurcations and encounters. But for this to be the case, no discipline can be set up in an overseeing relation to the others—on the contrary, they must be underdetermined by one among them. This is a kind of generalization to objects and to disciplines of Quine's idea of the underdetermination of facts by theory, but in an epistemology where theories are no longer opposed to facts.

From These Consequences, to Construct Indirect Relations Between Arts and Sciences

One can no longer attain a birds-eye view of either the arts or the sciences. Just as Maurice Matieu proposes a piecemeal approach, we find in contemporary epistemology the emergence of a notion that we believe to be of great importance, that of the

intermediary, of an intermediary theory or axiomatic. It was introduced by K. Merton in the nineteenth century, taken up again to understand biology by Jean Gayon, and has been used independently by Fernando Zalamea to understand the variety of contemporary mathematics, etc. This notion is without doubt a way of surpassing the frontiers of an epistemological space limited by the concepts of theory and fact, and which implies the idea that the sciences find themselves in a unified space, or even that they can unify themselves.

One can no longer pass from one fragment of science to another naively, making autonymous collages. This whole work supposes a modelization of fragments. One can no longer make epistemology depend upon one particular science, but only on modeled elements of one science and another. This is one of the results of François Laruelle's non-standard philosophy, which is opposed to Alain Badiou on precisely this point—one can no longer directly make of set theory, even Paul Cohen's set theory, a foundation for philosophy.¹⁰ The notion of the intermediary is beginning to modify the relations between the universal and the local.

A New Interpretation of Mannerism

In this new context, how can we account for the relations between modes of knowledge, if objects are not given even as open objects, but as objects 'X'? We need to move towards the construction of an angle between arts and sciences—we cannot simply place them alongside one another, but their invisible relation is always there.

In order to manifest this relation, we see another concept emerge, which has a particular history around public space (Habermas) or cafés as sites, but which has seen a renaissance in ethnopsychiatry, under the name of 'collective intimacy'.¹¹

10. See F. Laruelle, *Anti-Badiou*, tr. R. Mackay (London: Bloomsbury, 2013), and the chapter 'philosophica acta' in Mathieu and Schmid (eds.), *Modélisation et interdisciplinarité*.

11. Ounkpatin, Perez, Wexler-Czitrom, Courbin, 'Vers un nouveau paradigme: la Clinique de la multiplicité et la fabrication de « l'intime collective »', *Comprendre et traiter les situations interculturelles, approches psychodynamiques et psychanalytiques* 67 (2011), 55–107. A.-F. Schmid, M. Mambrini-Doudet, A. Hatchuel, 2011; Schmid, 2011, 'Epistémologie générique: de l'ego à l'« intimité collective » de la science', *Actes de l'Académie des sciences de Russie, Institut de philosophie* 41:5 (2011), 145–56.

9. N. Mathieu and A.-F. Schmid (eds.), *Modélisation et Interdisciplinarité. Six disciplines en quête d'épistémologie* (Paris: Quae, 2014).

Collective intimacy is a mode of scientific exchange which no longer depends upon disciplinary logics

This concept has now been used in various domains, as discussed in a round table at a Cerisy colloquium on interdisciplinarity (September 2013),¹² and also in the thesis of Paris Chrysos (Ecole des Mines, Paris, December 2013) which aims to transform or complete the notion of network so as to understand personalized technological objects. Collective intimacy is a mode of scientific exchange which no longer depends upon disciplinary logics, but allows for the construction of a commons whose contents cannot be reduced to a discipline, within a generic space. Collective intimacy supposes a change of register which permits disciplines to intersect, once they have been processed, which allows one to place their fragments in superposition when brought together by the subtractive discipline or discipline+1. Through this procedure, one can use aesthetics for the sciences, and vice versa. This relation between disciplines constitutes a gesture bringing sciences and arts into indirect relation with one another.

Conclusion: Cigoli as Model?

Let's come back to the Madonna on the craters of the moon. Let's see neither the Madonna nor the moon as given objects, but instead open them up by combining them with the knowledges that they suppose, render them non-synthesizable by placing their contents in an intimacy with one another, treating them as unknown objects 'X'. Moon and Madonna will then be not just given objects, but particular models of science and art on whose basis many other objects and relations can be composed, whether in the sciences or in the arts, but in such a way that the minimizes the presence of any all-surveying point of view. Then we can sketch out links other than the chronological between the art of Cigoli and contemporary art, and, likewise, between the sciences and the arts. What should we make of the light and the movement of the fabrics, then? Objectal intimacy, at once personal and non-synthesizable.

12. Round table: Epistémologie générique des « communs » entre interdiscipline et discipline, Colloque de Cerisy, September 2013 (A.-F. Schmid, A. Perez, E. Sanchez-Albarracin, M. Mambrini-Doudet, L. Coutellec), publication forthcoming.