

Kenner, Frampton, Pound, and Writing

Whatever its merits, and it has many, the analogy between film and consciousness cannot be made completely general. Frampton was acutely aware that the forms of many films resemble hardly at all the changing contents of consciousness. For Frampton, film—all film that exists—constitutes a vast archive that chronicles, first, the possibilities of the cinema and, second, by doing so, the various modalities of consciousness. His work, then, is predicated on the conviction that cinema reflects the nature of consciousness, and that its different forms reveal the shapes and conditions that consciousness can assume. To understand the reasons for this, we can again go back to Frampton's relations to Pound—and here we must consider troubled aspects of his relationship with his artistic forebearer. He remarked in an interview with Deke Dusinberre and Ian Christie.

The *Cantos* have . . . always been a particular kind of thorn in my side because there is, it seems to me, a real disparity—well, the work is *not* rigorous. It has a certain kind of architecture; it's possible, let us say, to separate it out into massive blocks. In due course, one way or another, Pound even manages to inform us that there is a kind of subtext to the *Cantos*, as there is to [James Joyce's] *Ulysses*, and that subtext is the *Divine Comedy* in a general sort of way. But it doesn't wash too well to have spent two *Cantos* on the *Inferno*, separated by a very short distance in the poem from the first incursion of Pound's orientalism (at that point in an almost pre-Raphaelite or Swinburnian form); it is, without being very detailed about it, a hell of a long way from the use *Ulysses* made of the subtext of the *Odyssey*, to keep returning to those examples. . . . At a certain point the poem, for all its extraordinary local inventiveness, begins to teeter. Okay, I'd like to make something that is simply not in pieces, one after another, in the order that I happen to be able to make them. Which, again, is Pound's problem. Joyce, as he worked on the text of *Finnegans Wake*, of course, did not write it from beginning to end. He wrote *at* the whole book, as it were, until the whole book was written. That seems to be a more useful model. (2004, 113)

Continuing his commentary on his work—Frampton expressly connects this comment to his uncompleted film cycle *Magellan*, but I believe its point applies more generally to Frampton's work—he extends his reflection on the nature of montage, which brings the viewer to see one thing after another.

In the *Odyssey*, for instance, there's no particular reason why, having escaped the enchantments of Circe, Odysseus should then next come drifting ashore and become Nausicaa's lover. There's no direct causal link between that; it's a model of history which at least questions the notion of causality. There may or may not be causal links. What those links are—the nature of why, say, one shot follows another, or one segment follows another—is at all times under construction, as is the nature of the passage of the energy of attention from one segment, one shot—one frame, even—to another. (108–9)

Frampton protests against arbitrariness in the sequence of elements that make up most artworks. He admires works that make it possible to offer a reason why one element follows another or why attention shifts from one segment to another, and he wants to formulate compositional methods that will make it possible to give an account why one shot follows another, or one segment, or even one frame. We are making progress, Frampton suggested:

our thinking about the cinema has evolved to the point that we are now “able to give examples from film of any given category or any operative principle that we can discern as applying to the making of other works of art. If we are at the incipience of a period of precision, then we are at its very first moments. So it would have taken me, let’s say, ten years to write the other part of [“Notes on Composing in Film”]” (110).

Frampton demanded that the elements of an artwork be organized according to universal principles that reflect the order of being, not the vagaries of momentary feeling. The idea of composing by adhering to universal principles is interesting enough. Just as interesting is the claim Frampton stakes in this remark, *viz.*, that any operative principle that applies to literature, say, or to painting, will also apply to film.

Kenner’s ideas on the modern turn in art influenced Frampton enormously, and it behooves us to examine them. In a fine piece of commentary, among the best written on this difficult artist, Federico Windhausen makes much of Kenner’s influence on Frampton. He argues that Kenner provided Frampton with a different way of understanding art—an approach unlike (and arguably more radical than) the romantic model that was commonplace in the 1960s and ‘70s.

As Windhausen notes, Frampton expressed his anti-romantic animus when he came to discuss P. Adams Sitney’s historiography, which is encapsulated in “The Idea of Morphology” and fleshed out in *Visionary Film* (1972, 53–33). Sitney has acknowledged the impact that Harold Bloom’s writings on romanticism had on him. The central argument of *Visionary Film* is that the American avant-garde film is a romantic cinema and that whatever beliefs American avant-garde filmmakers have shared—and Sitney argues convincingly that these filmmakers have had more in common than they ordinarily care to admit—derive largely from the romantic tradition. Frampton’s own writings show that he had a deep interest in early, high modernism and in what he called the “Generation of the 1880s”—those artists born in the 1880s who went on to contribute fundamentally to the development of early, high modernism. Kenner shared this interest, and his writings on these writers and artists might have helped Frampton see the way beyond Sitney’s Romanticism (and that of other writers studying the advanced arts in America in this period): Kenner, Windhausen notes, viewed the “Generation of the ‘80s” as militantly anti-romantic. Frampton deployed the idea that art making has some resemblance to playing a game in his anti-Romantic campaign (or what Frampton thought of as his anti-Romantic campaign). “Art in a Closed Field” proposes that poets and novelists of the modern era redefine the boundaries of their respective practices by selecting specific elements from the medium with which they work (or, alternatively, from their environment) and ordering them according to laws or rules of their own devising. Kenner describes this method as involving the arrangement of a finite set of elements within a closed field; and while he acknowledges this “sounds like a game,” the game analogy receives only occasional mention (1962a, 599). For Kenner, the modernist aesthetic is based on the linguistic paradigm of a combinatory process within a closed field, where what is important is the generation of novel syntactic relations. Kenner began “Art in a Closed Field” by pointing out that he developed his idea of artists making using use of a closed field by analogy with the notion of a field in general number theory (actually group theory). The second paragraph of that article reads:

I am going to argue (1) that the recent history of imaginative literature—say during the past 100 years—is closely parallel to the history of mathematics during the same period; (2) that a number of poets and novelists in the last century stumbled upon special applications of what I shall call, by mathematical analogy, the closed field; (3) that this principle has since been repeatedly extended, to produce wholly new kinds of literary works; and (4) and that it is worth knowing

about, and of general applicability, because it helps you make critical discoveries; by which I mean, that it helps you to think more coherently and usefully about the literature of both our own time and times past.
(ibid., 597–98)

We should consider the impact this passage would have had on the filmmaker-to-be trying to find his way in the New York City art world in the early 1960s. In navigating that milieu, Frampton encountered the work of Stan Brakhage. At first, his letters home expressed unalloyed admiration. In time, the respect he had for avant-garde film's dominant figure became mixed with other feelings (that, ironically, one could characterize best through recourse to *The Anxiety of Influence: A Theory of Poetry* (1973), by that arch-romantic critic, Harold Bloom). Frampton recognized the protean character of Brakhage's filmmaking: Brakhage had worked in, and mastered, nearly every conceivable form. That left Frampton with the troubling question whether there was anything left for other filmmakers to do. Kenner's commentary might have provided him with a clue about how he could escape the seemingly near-inescapable anxiety over the commanding role Brakhage had in the avant-garde cinema of the time. Brakhage is nothing if not a romantic, so Kenner's article, with its seemingly anti-romantic thrust, might have shown Frampton a way that (he believed) would allow him to escape romanticism altogether, including the romanticism of Brakhage's work. What is more, it showed Frampton how he could avoid that keystone of romantic poetics, the association of the singular authorial voice with an exquisitely developed sensibility, through the introduction of heterogeneity.

"Art in a Closed Field" lays out what he sees as a modern understanding of composition, one Kenner relates to Joyce (though it is applicable to other writers). He began by describing a document that had been prepared at the University of Wisconsin, an alphabetical list of all the words that appear in James Joyce's *Ulysses* (1922) and the number of times each appears. Kenner noted that, although we might deem it peculiar to prepare such a list for most novels, to prepare a lexicon for *Ulysses* does not seem at all strange. The reason it does not relate to that work's character. Kenner explained this by saying that the activity the research team at the University of Wisconsin engaged in when preparing the lexicon was "oddly similar" to what Joyce did when he composed *Ulysses* in the first place.

The closed set of words which we call the book's vocabulary was most deliberately arrived at. It was not simply Joyce's own vocabulary, but one that he compiled. And the rules by which the words are selected and combined are not the usual rules that used to be said to govern the novelist. The traditional novelist is governed by some canon of verisimilitude regarding the words people actually use and by a more or less linear correspondence between the sequence of his statements and the chronology of a set of events. In "Ulysses" the events are very simple, and are apt to disappear beneath the surface of the prose; the style, as the book goes on, complicates itself according to laws which have nothing to do with the reporting of the visible and audible; and again and again we find Joyce inserting a word, or a combination of words, precisely so that he can allow it to carry a motif, as in music, by simply repeating it on a future page. System, in fact, sometimes took precedence over lexicography. (598–99)

The events in Frampton's films, too, are very simple, and are apt to disappear beneath the form's surface. Furthermore, in his work, system sometimes takes precedence over lexicography.

In short, composition has come to be understood as relying on a restricted set of items (the "content" of the work) and processes for arranging them. Kenner notes that though his

exposition of this notion began with commentary on James Joyce's writing, other advanced writers have shared that idea, and it can be shown to be the notion of composition behind much modern writing: "For it seems that one can multiply without effort out of the literature and criticism of this century example after example of the habit of regarding works of art as patterns gotten by selecting elements from a closed set and then arranging them inside a closed field" (ibid.).

As he goes on to expound his conception of a literature of a closed field and explain its importance, he develops a number of points that suggest the influence this article might have had on Frampton. First, he stresses the importance that "separation" has in the process. Elizabeth Sewell was among the first to understand this method of composition when she wrote about Lewis Carroll's "nonsense."

Now the field of Nonsense, she goes on to show, is not blur and fusion but separation and control. Its field is, once more, the closed field, within which elements are combined according to specified laws. "The process," Miss Sewell writes, "is directed always towards analysing and separating the material into a collection of discrete counters, with which the detached intellect can make, observe and enjoy a series of abstract, detailed, artificial patterns of words and images. . . . All tendencies towards synthesis are taboo: in the mind, imagination and dream; in language, the poetic and metaphorical elements; in subject matter, everything to do with beauty, fertility, and all forms of love, sacred and profane." (599–600)

Frampton recounts that when he and Carl Andre were quite young (in their early twenties), Andre began producing poetry through a method very similar to that which Kenner outlines, "Carl had momentarily run out of money and sculptural opportunity. In the autumn of 1960 he again turned his attention to poetry. Earlier poems had been freely rhymed lyrics; now he began taking given texts and "cutting" directly from them as from timber, mapping upon words what he had learned from sculpture" (282).

"Art in a Closed Field" continues with remarks on the modern notion of composition as depending on a finite number of separated elements and rules for the combination of these fixed elements, and on the identity of the separated elements that will subsequently be recombined. Flaubert (another of Frampton's favorite artists) took the step of identifying the elements of the novel as words. Flaubert's novels—that is, the combinations of words he forges—are constructed to make us see the common words they are composed of in a new light.

Now Flaubert's interest in the isolated word is the residue of nearly two centuries of lexicography, which had virtually transformed the vocabulary of each written language into a closed field. The dictionary takes discourse apart into separate words, and arranges them in alphabetical order. It implies that the number of words at our disposal is finite; it also implies that the process by which new words are made has been terminated. Hence, the persistent lexicographical concern, from Johnson's day to nearly our own, with fixing the language. That Shakespeare had no dictionary and that he was less occupied with words than with a continuous curve of utterance are corollary phenomena. . . . Flaubert, the connoisseur of the *mot juste*, comes to terms with the fact that, whatever printed discourse may be modeled on, it is assembled out of the constituents of the written language; and the written language has been analysed, by a long process which took its inception with the invention of printing, into Miss Sewell's two

desiderata: a closed field, and discrete counters to be arranged according to rules. (600–1)

Early in *The Stoic Comedians: Flaubert, Joyce, Beckett*, Kenner expanded on this McLuhanite argument concerning the effect of that printing press—he did so by extolling an insight of another critic who did his doctoral studies with McLuhan.

The Rev. Walter J. Ong, S.J., has argued brilliantly that printing was the efficient cause of those intellectual movements which in the sixteenth and seventeenth centuries destroyed the hierarchies of knowledge and rearranged the things we know for the sake of pedagogic convenience. Certainly it was printing which led us to think of speech as being composed of interchangeable parts, if only because printing and its by-product lexicography enforced a uniformity of spelling which gave each separate word a stable identity to the eye, whatever its equivocal status for the ear. After that, writing becomes a matter of locating and arranging words, as Joyce spent his celebrated day trying out different arrangements of fifteen words: “Perfume of embraces all him assailed. With hungered flesh obscurely, he mutely craved to adore.” (1962b, 37)

Extrapolating from this McLuhanesque key idea, Kenner goes on to discuss the impact the Gutenberg Revolution and the Enlightenment had on the art of literature.

We have grown accustomed at last not only to silent reading, but to reading matter that itself implies nothing but silence. We are skilled in a wholly typographic culture, and this is perhaps the distinguishing skill of twentieth-century man. The language of printed words has become, like the language of mathematics, voiceless; so much so that to meet the demands of writing that does imply the movements of a voice is itself a skill, highly specialized and grown increasingly rare. And simultaneously we have begun to encounter much theory concerning language as a closed field. To program a translating machine, for example, you must treat each of the two languages as (1) a set of elements and (2) a set of rules for dealing with those elements. These rules, correctly stated, will generate all possible sentences of the language to which they apply, and of this concept the sentences in a given book may be regarded as special cases. It will be objected that this is a strange way to talk about the Gospel according to St. John. It is; and when we talk of a body of specifiable mass describing an elliptical path at one focus of which spins a globe of ionized atoms, that is an equally strange way to be talking of the earth on which we walk. *That earth was invented in the seventeenth century, when much else was invented.* (ibid., xv–xvi)

Kenner went on to make a remark about *Bouvard et Pécuchet* (1881, a work that Frampton mentioned several times in his writing) that could be taken as a misfiring parody of a Frampton film, “Everything, throughout his novels, is menaced by the débâcle of the absolutely typical; ‘Bouvard and Pécuchet’ does but repeat the same small cyclic motion, study, enthusiasm, practice, disaster, over and over until it has used up all the things that the curriculum affords us to study: a closed field of plot consuming a closed field of material” (ibid., 602). In considering the implication of repeating the same cyclic motion (a closed field of plot) over and over until it has consumed all available materials, Kenner arrived at a description of the new conception of art making that arises from these procedures. “The notion of language as a closed

field may be attributed to the dictionary and behind it to the printing press, which insists, as does its domesticated version the typewriter keyboard, that we have at our disposal less certainly the possibly infinite reaches of the human spirit than twenty-six letters to permute" (ibid.) The idea of the twentieth-century artwork that Kenner announces here is very close to the understanding of art making that gave rise to *Zorns Lemma* or *Magellan*.

Compare this with remarks Hollis Frampton made about his *Surface Tensio* (1970) in an interview with Michael Snow:

I wanted to make a film out of a relatively small number of simple elements, which would be of a piece, to see how much resonance I could generate among those elements. As you know, the film fundamentally contains 3 shots—a man talking while his digital clock runs; a single dolly shot from the middle of the Brooklyn Bridge to the lake in Central Park; and a goldfish swimming very slowly back and forth in a tank outside the sea. Further, it contains only 2 quite simple sounds: one, the sound of the telephone ringing 37 times; and the other, a prose description which for the average speaker of English comes through as a single prolonged sound because it's in a foreign language—in this case, German. (1970, 10)

Kenner's "Art in a Closed Field" laid out the aesthetic principles that led to such interest in lists, surveys, catalogues and inventories, as he comments on James Joyce's *Ulysses* (a book Hollis Frampton loved very much).

Here we should return to Joyce. We may take "Ulysses" to specify one arrangement, and in the author's judgment the most significant arrangement [we shall have much more to say of this idea of the work of art being, ideally, the most significant arrangement], of all the ways its quarter-million words might be arranged. Were we to say the same of a novel of Walter Scott's, it would be merely a theoretical statement, but when we say it of "Ulysses," we feel we are saying something relevant to the book's nature. Joyce wrote in the midst of an economy of print, surrounded by other books on which to draw. He possessed, for example, Thom's Dublin Directory for the year 1904. He possessed dictionaries, in which to find the day's words and verify their spelling. He possessed other books in which he could find lists of all kinds: the colors of mass vestments, for instance, and their significance . . . To adduce lists, to enumerate or imply the enumeration of their elements, and then to permute and combine these elements: this, Joyce seems to imply, is the ultimate recourse of comic fiction. (1962, 603–4)

The form of humor that Kenner attributes to Joyce has a proclivity toward becoming an intellectually humorous opus characterized by miscellaneous contents, displays of curious erudition, and comical discussions on philosophical topics.

Kenner's commentary on Samuel Beckett's *Watt*. Beckett wrote the novel, in English, while in hiding in Roussillon during World War II—the work is very dark in its outlook. It takes human drives to be absurd, and so it often treats human movement as an extended series of permutations (as they lack ground or end). "Art in a Closed Field" comments on that feature.

Beckett's second novel, "Watt" (1953), has for point of departure the great catechism in the seventeenth episode of "Ulysses"; and repeatedly it defines, with frigid deliberation, closed fields the elements of which it doggedly permutes

through every change that system can discover.

Here he stood. Here he sat. Here he knelt. Here he lay.
Here he moved, to and fro, from the door to the window, from
the window to the door; from the window to the door, from
the door to the window; from the fire to the bed, from the
bed to the fire; . . .

and so on, until each possible route between bed, door, window and fire has
been traced in each direction. (Kenner 1962, 604)

Kenner's analogy between mathematics and modernist art has still deeper implications. Drawing on examples from Flaubert, Joyce, and Beckett, he reflects on the changes that occurred in consciousness in the early and middle decades of the twentieth century. Although he didn't use the word, Kenner's purpose in "Art in a Closed Field" was to inquire into the changes taking place in the age's *paideuma*. His real topic, he stated, was a way of thinking that is more pervasive than Flaubert, Joyce, and Beckett: Kenner claimed that the idea of a closed field, drawn from general number theory, has become the dominant intellectual analogy of the time. Our age uses general number theory rather as the Enlightenment used Newtonian physics and the Victoria era used biology. "The closed field is a mathematical analogy. Let me put this as flatly as possible: the dominant intellectual analogy of the present age is drawn not from biology, not from psychology (though these are sciences we are knowing about), but from general number theory" (1962, 605).

Kenner goes on to develop some precisions about his use of the term "field," a key term of use in unpacking the epistemological and aesthetic implications of the present age's dominant analogy. Exploring these precisions in some detail will shed light on Frampton's historiography and the notions that led him to conceive of an "infinite film" that comprises all possible forms of knowledge. Kenner points out that for a mathematician, a field "contains a set of elements, and a set of laws for dealing with these elements. [The mathematician] does not specify what the elements are. They may be numbers, and the laws may be the laws that govern addition and multiplication. But numbers are a special case; in the general case the elements are perfectly devoid of character, and we give them labels like *a*, *b*, and *c*, so as to keep track of them" (*ibid.*, 606).

Mathematics at mid-twentieth century, Kenner suggests, understood itself as a formal system. On that understanding, mathematics is a system liberated from our intuitions about the familiar world—intuitions about three dimensions or counting processes. Its fundamental understanding of the axioms of field theory was not that they are propositions that are regarded as true without proof. Rather, it understood the field axioms as a set of constraints. These constraints have profound implications: if a formal system that provides the operations of addition and multiplication satisfies the conditions outlined above, one can know a great deal about that system.

Further, given a theory of fields, one can invent any number of systems (each comprising a distinctive set of elements and laws for manipulating those elements—or, even better, of undefined marks and laws for rewriting strings containing those marks). All that matters is that these systems be internally coherent—the system's relation to the real world is of no import whatsoever (though, we shall soon see, Frampton suggests that any formal, combinatorial system of appreciable complexity reflects a possible reality).

The analogy to developments in the arts from, say, 1850 to 1950 should be clear: at the beginning of the period, art was still thought to be about the world, but by the early 1900s, most

advanced thinkers and makers concluded that art making is more like shifting around elements belonging to a closed field, rearranging them according to definite principles.

It is very helpful, I find, to regard a work of art as proceeding according to certain rules (did not Coleridge say that it contains *within itself* the reason why each detail is so and not otherwise?). The rules may be changed beyond easy recognition by altering one postulate, and this is a common way for the arts to develop, although it is perhaps only now, with the assistance of field-theory and game-theory, that it is possible to see clearly that this is what has been going on. And the first business of the critic is to recover the rules of the game that is laid before him. (Kenner 1962, 608)

Did not Frampton declare Pound's *Cantos* to be a failure because it did not contain within itself the reason why each detail is exactly as it is and not otherwise? And did he not understand the task of the critic in a way consistent with that set forth in "Art in a Closed Field? He declared that task to be the exfoliation of the rules governing the formation of the art work at hand.

Frampton's remarks on the meta-history of film suggest an orderly, developmental process in filmmaking, whereby if one postulate (for example, a statement of the form "film is X") is changed for another of similar form, it results in a massive change in the rules governing work in that medium. "The innovator," Kenner states, "commonly changes a familiar law or two, and in so doing defines a closed field of possible works within which his own work finds its place" (ibid.). This sounds exactly like the historical process within which Frampton saw himself working. In "For a Metahistory of Cinema: Commonplace Notes and Hypothesis" (1971), Frampton wrote, "In the 1830s . . . Évariste Galois died . . . leaving to a friend a last letter, which contains the foundations of group theory, or the metahistory of mathematics" (Jenkins 2009, 133).

Loosely speaking, group theory is pretty much what Kenner describes the theory of closed field as being (though refinements and precisions must be introduced). A well-known primer of Galois theory begins.

A field is a set of elements in which a pair of operations called multiplication and addition is defined analogous to the operations of multiplication and addition in the real number system (which is itself an example of a field). In each field F there exist unique elements called 0 and 1 which, under the operations of addition and multiplication, behave with respect to all the other elements of F exactly as their correspondents in the real number system. In two respects, the analogy is not complete: 1) multiplication is not assumed to be commutative in every field, and 2) a field may have only a finite number of elements. (Artin 1966, 1)

A little more exactly (but still very informally), a field is a set of elements with a pair of compatible binary operations, which we shall designate as \oplus and \otimes , are defined so that the following axioms hold (these operations are similar in most respects to addition and multiplication for the set of real numbers)

- 1) closure under \oplus and \otimes , i.e., given any two elements, a and b that belong to set F , the $a \oplus b$ and $a \otimes b$ also belong to F .
- 2) associativity of \oplus and \otimes , i.e., for all a , b , and c in F , $a \oplus (b \oplus c) = (a \oplus b) \oplus c$ and $a \otimes (b \otimes c) = (a \otimes b) \otimes c$.
- 3) commutativity of \oplus and \otimes , i.e., for all a and b in F , the following equalities hold: $a \oplus b = b \oplus a$ and $a \otimes b = b \otimes a$.

4) existence of identity elements for \oplus and \otimes , i.e., there exists an element of F , denoted by 0, such that for all a in F , $a \oplus 0 = a$. Likewise, there is an element, denoted by 1, such that for all a in F , $a \otimes 1 = a$. (The two identity elements, 0 and 1 are required to be distinct; for addition and multiplication, the identity elements are 0 and 1 respectively.)

5) existence of inverses for \oplus and \otimes , i.e., for every a in F , there exists an element a^{-1} that is also a member of F , such that $a \oplus (a^{-1}) = 0$. Similarly, for any b in F other than the identity element for \otimes , there exists an element b^{-1} in F , such that $b \otimes b^{-1}$ equals the identity for \otimes .

6) distributivity of \otimes over \oplus , i.e., for all a , b , and c in F the following holds: $a \otimes (b \oplus c) = (a \otimes b) \oplus (a \otimes c)$. (For addition and multiplication, the respective inverse operations are subtraction and division.)

We can develop different algebras by specifying different operations that meet the conditions laid out above, or by supplementing that operation with others. Thus, group theory defines the game whose development can be described pretty much in the way that Kenner described the development of recent art: “the rules may be changed beyond easy recognition by altering one postulate, and this is a common way for the arts to develop” (1962, 608). I have noted a tendency in art deriving from the oeuvres of Duchamp and Stein that explores how a slight change (often in some element’s context) can produce a major change in our response (to that element)—one thinks immediately of Michael Snow’s *Walking Woman* (1961–1967) series in this connection. Kenner identifies a related approach—how a light change in a form-generating algorithm produces a major change in the form.

Frampton’s remarks on meta-history (of mathematics and cinema) suggest that any discipline develops much in the way Kenner described art as developing—by altering its postulates, one after another, in some systematic fashion. The postulates that provide the constraints on the historical development of a field are its meta-history; the chronicle of its actual, empirical development, which are subject to the many vagaries and vicissitudes of a less than ideal realm, is its history. As an example of the difference between history and meta-history, Frampton provides the following example: “In the 1830s, Georg Büchner wrote *Woyzeck*. Évariste Galois died, a victim of political murder, leaving to a friend a last letter which contains the foundations of group theory, or the metahistory of mathematics. Talbot and Niépce invented photography. The Belgian physicist Plâteau invented the phenakistoscope, the first true cinema. In the history of cinema, these four facts are probably unrelated. In the meta-history of the cinema, these four events may ultimately be related” (Jenkins 2009, 133). Let us examine this comment in the light of what we have learned about the background of Frampton’s idea of meta-history. The comments I make regarding the meta-historical relations amongst the four events will be conjectural; whether or not they are actually what Frampton had in mind (we will never know), they will serve to give a sense of how Frampton’s idea of meta-history might be construed. To say that in the history of cinema a set of facts are probably unrelated is simply to say that there is no empirical or causal connection between them, i.e., Büchner’s writing *Woyzeck* (1837) had no demonstrable influence on Évariste Galois’s founding group theory. However, we can discern the following logical connections amongst the events Frampton enumerated. First, Évariste Galois’s group theory deals with the idea of taking a finite number of elements and subjecting them to specified operations (or clearly defined rewriting rules). Plâteau’s phenakistoscope takes a finite number of elements and, by presenting them rapidly in succession, creates the impression of movement. Mathematical processes reflect mental operations—because Galois’s group theory is so fundamental to mathematics, it must model elementary mental operations. Since Plâteau’s phenakistoscope operates on the same abstract principles as Galois’s group theory, Plâteau’s phenakistoscope, too, must model elementary

mental operations. When those elements animated by the phenakistoscope—or by some other apparatus (such as a projector) that involves a similar mechanism (and so operates according to a similar process)—are photographs, which the work of Fox-Talbot and Niépce allowed, then it is the real that is animated. We then can say that the resulting medium (the cinematic apparatus) models the mind's experience of the real.

Büchner's *Woyzeck* is a hallucinatory work: Franz Woyzeck, a lowly soldier who is the protagonist of the piece, experiences a nervous breakdown, which the spectators come to experience from Woyzeck's point of view: one of the best-known examples is that they hear the doctor treating Woyzeck tell him that he must eat nothing but peas. So in *Woyzeck*, we see the mind's experience, though rooted in the real (Büchner presented the soldier's experience as the result of the poverty in which he was raised), take a turn toward the fantastic.

The connection among Galois's group theory, Plâteau's phenakistoscope, and Fox-Talbot and Niépce's photography has to do with the way that a sequence of finite elements, appropriately presented, can give the illusion of the real. The rules of *Woyzeck* provided for mapping a set of objective incidents into the space of a subjectivity whose deviations from conventional norms (evaluated according to some appropriate metric) indicate to the spectator it is of a hallucinatory character—a sequence of elements can present another sort of illusion that is taken to be reality.

In time, Frampton came to believe these generative transformational procedures could be expressed algorithmically (that is, he came to think of the transformations of one set into another as rule-guided procedures). He also understood the implication: if these operations could be expressed algorithmically, they could be given mathematical form. Thus, Frampton remarked, "No one knows [at this point in history] enough to write a book [on cinema] in three parts, the name of that book being *Principia Cinematica*. Part One is called 'Definitions', Part Two is called 'Principles of Sequence', Part Three is called 'Principles of Simultaneity'" (Dusinberre and Christie 2004, 110). The model Frampton is likely alluding to is Bertrand Russell and Alfred North Whitehead's *Principia Mathematica*.

No sooner had Frampton alluded to Russell and Whitehead's masterwork in the foundations of mathematics than Ian Christie interrupted: "A rationalist approach, which identifies your operation as an attempt at a modern *mathesis universalis*—the kind of enterprise that would have been entirely comprehensible to Descartes, or to any of the philosophers of the *Encyclopédie* period. That would seem to be your working model?" (2004, 110). Frampton replied,

Right on the button. At the same time, of course, I know very much more than they did, because they are precisely what I know. What interests me among all those interactive, closed rational systems is the particular manner—the particular point in their operation—where they most begin to resemble the universe. And that is the point where, after they have been in operation for some time, they begin to generate discrepancies, irrational values, accumulations of error. Where the operations begin to interfere with themselves or with each other to such an extent that what is generated appears not to permute but to be absolutely smooth and continuous, becoming—if we believe in causality—causally seamless, but at such a level that it seems incessantly to just fail to dis-intricate the lines of self-interference from the system. (111)

We opened this talk by citing Frampton's account of why he believed Pound's *Cantos* to be a failure: the *Cantos* were not conceived as whole, as Joyce's *Ulysses* was, and Joyce's method of composition, Frampton maintained, provides a "more useful example." The comment does much to suggest the radically novel character of the strain of modernism Frampton admired. Frampton called for, and strove to make, a radical art, about which one would be able say why

“one shot follows another, or one segment follows another.” He required the order of every shot in a film, and the length of each, to be accounted for by underlying rules or axioms. He presented that idea in an interesting way, in a theorem he dared to call “Brakhage’s Theorem”: “For any finite series of shots [“film”] whatsoever there exists in real time a rational narrative, such that every term in the series, together with its position, duration, partition, and reference, shall be perfectly and entirely accounted for (Jenkins 2009, 144). Frampton was tweaking Brakhage’s nose. Brakhage dismissed narrative forms from film, believing they had similar deleterious features as deep-space illusory images do: both narratives and deep-space images are organized around a focal element, and the various elements that make-up both sorts of forms have different degrees of importance, depending on their functional relation to the focalizing elements. [A maker is most free to invent forms when he or she is not constrained by such pre-weightings.](#)

The ironic tenor of Frampton’s discourse might make us overlook how radical the epistemological point he wants to make really is. Frampton’s epistemology rests on two fundamental principles. The first is that order is not material, but ideal: the world of experience arises as we shape the manifold of pre-cognized intuition. The second is that the fundamental principles of order can best be expressed in mathematical or, at least, algorithmic form. Consciousness swims in an ocean of pre-cognitive impressions, and we make sense of them by imposing a pattern on them. The rules that embody the procedures for constructing these patterns are constitutive: they make the world of which we are aware. Frampton proposes that these procedures can be expressed in algorithmic form, and that these algorithms often can be expressed as mathematical formulae. A vaguely Kantian conviction underlies that assumption: whatever we sense has spatio-temporal extension; whatever is extended has the character of a plurality (it extends through a multiplicity of spatial and/or temporal points), but through an act of synthesis we construct a common form (an object) from this multiplicity. The patterns perdure, even while their contents change. The order of our various sensations arises from connections that are not given in sensation alone; the mind (nowadays we would likely say “computational mind”) creates the rules of their relations—and is conscious that this combination is of its own making.

System, Structure, and Mind

Paul Valéry, a poet with a profound interest in mathematics, discerned the deeper implications of this notion of structure. There is abroad a widespread skepticism about poets or artists who take an interest in mathematics (or theoretical physics), and for quite some time Valéry’s *Cahiers* (1957–1961), in which he recorded his ruminations on mathematics, the theory of the self and aesthetic form, were disregarded. However, in time they came under scholars’ scrutiny, and when they were subjected to methodologically rigorous examination, literary historians and aestheticians became increasingly aware of the depth and rigor of Valéry’s interest in mathematics. They came to recognize that interest shapes his entire intellectual “System” (as he called it), just as Frampton’s interest in mathematics shaped his intellectual outlook (and his aesthetic theories), and that unless one deals with ideas about mathematics, one cannot appreciate his aesthetics. Like Frampton (who commented on his predecessor in “Invention Without a Future”), Valéry sought to link the new science and mathematics of the twentieth century to the humanities in general, and to poetics in particular. Valéry referred to the different outlooks of science, mathematics, and the humanities (as Hollis Frampton well could have), as different *optiques, points de vue, or manières de voir*.

Valéry dreamt of an “algèbre de l’esprit,” an algebra that would reveal the principles according to which the mind operates. Algebra Valéry defined as the “analysis of the transformations of a purely differential phenomenon” (that is, phenomena are distinguished—cut apart—from one

another) and deemed it “the most faithful document of the mind’s properties of grouping, disjunction and variation” (1957-1961, 1:36). Like Leibniz (and Frampton), Valéry thought of mathematics as a language—one which has a privileged relation to mind. This language, this *algèbre de l’esprit*, he averred, would be a useful instrument in the study of the brain’s functioning. It has the attributes of a closed system discussed above. Valéry remarked, “My specialty—reducing everything to the study of a system closed on itself and finite” (19:645). It would also be an *arithmetica universalis*, a language in which “the physical and psychological could be compared,” a language of mathematical rigor into which “propositions of every kind could be translated.”

Paul Valéry believed that it would be fruitful to seek a theory of mind using mathematical techniques to study mental processes as transformations and to identify invariant features of these operations. In 1900, Valéry proclaimed that “psychology is a theory of transformations, where one must discover the invariants and the groups, that is, figures and distances, in order to establish the psychological space” (ibid., 1:915). “The S,” Valéry wrote—intending the self—is “invariant, origin, locus or field, it’s a functional property of consciousness” (15:170).

Psychological life is “the transformation of data or their mapping [substitution]” (10:517). “The element of existence-consciousness is invariant with respect to all the transformations” (11:243). Paul Valéry’s little studied writings in which he applied group theory as a model for mental operations foretold later developments. In the 1940s, the linguist Roman Jakobson, the anthropologist Claude Lévi-Strauss and the mathematician André Weil met in Paris-on-the-Hudson (a.k.a. New York City). Lévi-Strauss’s anthropological work had already brought him to Jakobson’s work.

Jakobson first applied what he termed structuralist methods to the study of phonology. He was interested in studying language as a system, and the basis of his systematic approach was the idea that language is composed of elementary units (phonemes) that are differentiated (cut apart) from one another. Differences between phonemes arise from the presence or absence of minimal sound units, named “distinctive features.” Thus, phonological systems are to be understood in terms of binary oppositions. Binarism, shown by Jakobson to operate at the irreducibly minimal level of linguistic structure, was taken by researchers in other fields (including Lévy-Strauss) as a paradigm for analysis at higher levels.

Ultimately Jakobson came to believe that the foundations for structure are in the human brain. His belief that there is a mental basis for the tendency of systems to evolve through binary oppositions was adopted by Claude Lévi-Strauss. Lévi-Strauss argued the brain processes information by using symbolism and code that resembles a notation system. The purpose of structural analysis is to uncover this code, which follows mathematical models (like those that Nicolas Bourbaki studied). The symbolic code, embedded in the brain, determines how the brain processes information, how language operates, and how society is structured.

With this work, Lévi-Strauss founded the structuralist approach to the study of art and culture. He identified four procedures as basic to the structuralist method. First, structural analysis examines unconscious infrastructures of cultural phenomena; second, it regards the elements of these infrastructures as “relational,” not as independent entities; third, it attends single-mindedly to system; and fourth, it propounds general laws accounting for the underlying organizing patterns of phenomena. Structuralism’s canonical principle, as laid down by Lévi-Strauss, is that the code precedes and is independent from the message, and that the subject is subjected to the signifier’s law; the essence of a code is that it can be translated into another code.

Structuralism, as Lévi-Strauss understood it, is directed towards identifying codes (the deep structure of myths, societies, culture, language, etc.), understanding how codes develop, and how codes change from one to another. This is also the fundamental method of group theory, with its emphasis on “deep structure” and invariants.

Frampton, for his part, proposed that *Magellan* would be a “totally inclusive work of film art as a

model for human consciousness. I propose a work of art (not a scientific or philosophical theory) that shall touch upon a sufficient number of shores to cartoon my own affective world. We may assume that each thing implies the universe, whose most obvious trait is its complexity; on that principle, I conceive, distantly, of an art of cinema that might encode thought as compactly as the human genetic substance encodes our entire physical body” (Jenkins 2009, 228). With this remark, Frampton claims to have discovered the code that governs consciousness. The cinema had given him the key to deciphering that code.

David Hilbert (1862–1943) was a universal mathematician whose lifetime intersected with the rise of abstract art, and who, as an early defender of Cantor’s set theory, contributed to the rise to ascendancy of formalist mathematics. He made fundamental contributions to the axiomatization of geometry, functional analysis, and was one of the founders of mathematical logic, proof theory, and invariant theory. He insisted on the abstract, formal character of his system, averring, on a number of occasions—following an idea of Richard Dedekind (1831–1916)—that in it, “points,” “lines,” and “planes” could be substituted by “chairs,” “tables,” and “beer mugs” without thereby affecting in any appreciable manner the logical structure of his theory. One could say, analogously, that “pure colors,” “pure shapes” and “pure forms” could be substituted for (pictures of) “hands,” “star-shaped cookies,” and “a tree in winter” without thereby affecting in any appreciable manner the relational structure of an artwork. If it is a moot point whether pictures or pure forms be used, why not use pictures? Incorporating them might add to the complexity and variety of phenomena to be examined—and so reveal more about the underlying binary structures that inform them. That, in turn, would shed more light on the operations of mind.

Further, Hilbert emphasized that the logical consistency of a concept as defined implicitly by the axioms of the system is the criterion of mathematical existence (Corry 2008, 139). A system that is internally consistent is self-generating, as Frampton told us.