

Topoi of Technology in Italian Experimental Industrial Film (1959-1973)

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ABSTRACT

After discussing some problematic premises of topic theory in relation to the study of cinema, the paper proposes to investigate audiovisual topoi by combining Rick Altman's "semantic/syntactic/pragmatic" approach to film genre with the structural perspective on audiovisual "textuality" developed by Gianmario Borio starting from the reflections of Michel Chion and Nicholas Cook. This methodological framework is applied to the case of Italian industrial cinema. An outline of the history of this non-fiction genre presents technology as a semantic field emerging in relation to the rapid industrialization process during the period of the so-called Italian "economic miracle" (1958-1963). Pragmatic aspects play a significant role. In those years the major industrial corporations and centres for scientific research (Enea, Eni, Fiat, Innocenti, Italsider, Olivetti) invested in cinematographic communication as a means to promote their image and popularize scientific-technological information, taking advantage of state subsidies. On this basis industrial cinema became a field of conscious audiovisual experimentation. Among the musical collaborators we find prominent avantgarde composers engaged in the field of both electroacoustic and instrumental music, such as Luciano Berio and Egisto Macchi. Their contribution produced a radical change in the soundscape of the genre, directly affecting the audiovisual representation of technology. Particularly electronic and concrete music were the fundamental component in the recurrence of audiovisual structures forming new topoi. Among these emerge both topical configurations aiming at producing simple communicational effects and elaborate constructions involving the use of rhetoric figures.

THEORETICAL AND METHODOLOGICAL PREMISES

Topic Theory and Audiovisual Topoi

Judging from its widespread applications in the field of musicology, and in spite of the frequent theoretical attempts to overcome the dichotomy, topic theory appears to be implicitly based on a rigid demarcation between signifier and signified.¹ What casts doubts on such rigidity is the fact that a musical "structure" (in the broad sense) on which a *topos* relies can trigger the signification process and refer to a given context only if some aspects of that structure belong in some way to the context. Consequently, the structure itself is at the same time the signifier (it refers to the context) and a part of the signified, since it contributes to defining or at least to connoting the context. A *topos*, however, cannot be identified in the structure as such. Rather, it is a symbolic process of endowment with

¹ See Hatten [1], Monelle [2] [3] [4] [5].

meaning implying intentionality. In other words, the structure can refer to a context in the intention of the author and/or of the recipient of the communicative act. It is a task of historical research, not of theory, to clarify the basic characteristics of each recurrence of a *topos*, such as the author's intention and the audience's reception. From a theoretical point of view we can merely note the hermeneutic circle between the structure occurring in a musical text or performance, and the aspects of the structure occurring in the habitual context.

At the same time topic theory is characterized by the tendency to an essentialist conception of musical *topoi*. The discussion of *topoi* in terms of abstract essences may result either from the historical persistence of the *topoi* and of the semantic field to which they refer or from the fact that scholars have a preference for long-term *topoi* referring to contexts that are connoted through music over time immemorial and characterized by simple musical structures that resist change. Yet, since *topoi* are symbolic processes triggered by recurring structures related to defined semantic fields, the possibility of highlighting their historicity is at the disposal of whoever decides to problematize the "difference" rather than greet the "eternal recurrence of the identical". Each use of a *topos* is in fact a result of negotiation among different actors: the author, the public and various cultural institutions.

I have focused on these questionable premises of topic theory because the difficulties deriving from them become inescapable as soon as one shifts attention from the musical to the audiovisual field. For as far as the first premise is concerned, it has to be said that moving images have the ability to represent objects and contexts in full detail, leaving little space for imagination: they exhibit or expose the semantic field directly in the audiovisual structure, breaking down any theoretical demarcation between signifier and signified. And as for the second premise, it must be admitted that audiovisual products embrace a more radical historicity, preventing one from maintaining an essentialist position. We can recall that the first audiovisual medium in the strict sense – that is, based on the synchronization of images and sound – was sound film, and the advent of cinema marked the passage from craftsmanship, that was typical of the traditional artistic fields, to an industrial production method, based on the division of labour. This determined a remarkable increase in the number of products, eliciting the recurrence of audiovisual structures related to semantic fields as well as the re-use of *topoi* that were formed in other artistic fields (such as music, literature, painting, theatre) as well as the emergence of new *topoi*, whose rapid formation is much easier to observe. A commercial system of distribution determined at the same time an increase of the public, so that communication became all the more important, encouraging the use of *topoi* in all the components of filmmaking: script, shots, sound effects, music and so on.

Concerning the role of music, the study of *topoi* in the audiovisual field can successfully develop in three directions at least: investigating how pre-existing musical *topoi* are re-used in cinema and other audiovisual art-forms through "remediation"; exploring the practical uses of musical *topoi* in the composition and improvisation of film music; focusing the attention on "audiovisual *topoi*" viewed as recurring structures exhibiting the correlation to a semantic field through the moving images, where sound or music can play a significant role.

Methodological Approaches to Audiovisual Structures

In pursuing this third direction, I will adopt countermeasures aiming at protecting against the theoretical pitfalls discussed above. Such countermeasures are implicit in the theoretical and methodological premises on which my research is based, and I shall briefly discuss them.

In the absence of studies explicitly devoted to audiovisual *topoi* characterized by the significant role of sound or music, I take from Rick Altman an anti-essentialist proposal developed in relation to the cinematographic concept of genre, which shares with the concept of *topos* the idea of a recurrence of semantically connoted structures. In order to account for textual and contextual aspects of film genres equally, Altman proposes what he calls a “semantic/syntactic/pragmatic approach” [6]. The last adjective, an update of an approach previously taken by Altman [7], offers a useful specification in the field of cinema, where the “pragmatic” aspects – those making reference to the system of production, distribution and reception in a certain historical context – play an important role. This is valid for a film genre as well as for an audiovisual *topos*. Even the latter, in fact, must be situated in its historical context in order to be understood as symbolic processes, and each cinematographic context includes a particular production-distribution-reception circuit. In any case, pragmatic aspects actually go beyond such a circuit, to include all the historical and cultural premises endowing a genre or a *topos* with its characteristic semantic connotations.

The “semantic/syntactic” approach needs to be adapted in relation to the case study that I intend to present. Through such an approach, Altman gives accounts of recurring “textual” aspects at the basis of fiction film genres; for this purpose he understands textuality in narratologic terms. This is the reason for the difficulties which arise when one tries to transfer such an approach directly to the genres of so-called “non-fiction” – a term which defines antithetically typologies of audiovisual communication that do not conform to the criterion of a (tendentially) linear and coherent narration of a story. In attempting to overcome such difficulties, I propose to complement Altman’s approach with other theoretical perspectives designed to highlight structural aspects shared by all the audiovisual forms.

Michel Chion was probably the first to foreground the structural relationship between image and sound/music in cinema and other audiovisual forms [8]. Subsequently, this aspect has been highlighted by Nicholas Cook, who focused attention on audiovisual products characterized by the centrality of music, that he defined “musical multimedia” [9]. More recently, Gianmario Borio has developed this theoretical perspective proposing a definition of audiovisual “textuality” as structural articulation “in two dimensions, whose presence is tangible in the two levels of film recording in pre-digital sonorous film: images and sound” [10]. The film and the magnetic soundtrack remain in fact separate for the greater part of the process of film production.

This approach makes it possible to clearly identify the structures of the audiovisual text on which every individual semantic process is ultimately based: the different components (photography, shot, dialogues, noises, music) combined through the main constructive processes (editing and synchronization) and developing a relation with objects and contexts represented by the moving images. Such semantic processes are at the basis of further signification strategies, becoming increasingly complex. Some of these strategies conform to the criterion of narration, which characterizes fiction cinema.

However, being based on the recurrence of an audiovisual structure, an audiovisual *topos* can also develop independently from narrative strategies.

THE REPRESENTATION OF TECHNOLOGY IN ITALIAN INDUSTRIAL FILM

Historical and Pragmatic Aspects

My historical investigation concerns audiovisual *topoi* related to a semantic field that took on increasing social and historical relevance during the 20th century: “technology”. The perimeter of the investigation results from the intersection between historical context and film genre. I will focus, in fact, on Italian industrial film in a period of extraordinary development, coinciding – not by chance – with the central years of the so-called “economic miracle” (1958-1963), a label which designates the sustained economic growth relying on a rapid industrialization process destined to produce profound transformations in the Italian social and cultural texture as well as in the landscape. The diffused perception of discontinuity from the past, even an ongoing epochal change, burdened technology deriving from scientific research and serving industry with new connotations, strictly tying technology to ideas such as innovation, revolution, projection toward the future; a technology that now seemed to serve man and peace, not war, as the tragic experience of the Second World War had shown.

Even in this case an inescapable hermeneutic circle emerges. Those connotations are in fact on the one hand “recorded” but on the other hand conveyed, encouraged, instilled and diffused by the media system of the period (journals, radio, disc, cinema, television) which actively participated to the construction of the technological paradigm as a socio-cultural context. Among them, industrial film occupied a central and strategic position.

A genre cultivated in Italy since the very beginning of the 20th century, during the 1930s – shortly after the birth of sound film – industrial film experienced a period of extraordinary vitality. In 1933 *Acciaio* (*Steel*), one of the first films produced by Cines, entirely shot in the Terni steelworks, introduced a high standard of audiovisual experimentation, involving outstanding collaborators: the film’s director was Walter Ruttmann, who since the 1920s had been an indefatigable experimenter with abstract film particularly in the field of editing and synchronization; the music was composed by Gian Francesco Malipiero, whose score allowed the director to obtain solutions and effects of great emotive impact, particularly in the representation of steel work processes; the screenplay had been adapted by Mario Soldati (uncredited) from a novel of Luigi Pirandello, using a very thin plot woven into a film intended to document and glorify Italian industry.

After the tragic events at the end of the Second World War, the genre re-emerged from the rubble with very limited means. Nevertheless industrial film began to conform to the communicative standard – not of course the productive standard – of Hollywood cinema, whose diffusion had been initially encouraged by the American occupation of Italy. Such standards emerged in the intentions of the corporations that commissioned the films and in certain characteristics of such products. As far as the sound is concerned, we encounter the predominance of “film music” intended as a stereotyped stylistic category:

scores for large orchestra with large sections of percussion and brass instruments, using leitmotifs and thematic-motivic elaboration, enlarged tonality frequently recurring to chromaticism, and the sense of apotheosis; all the musical processes rely on Western classic, romantic, and late romantic to impressionist traditions, where the construction of meaning and communication relied on a system of diffused musical *topoi*, and resorting episodically to the languages of a more advanced modernity. Between the end of the 1940s and the end of the 1950s there were some scrupulous productions, such as a 1949 short by Michelangelo Antonioni for the viscose industry, *Sette canne, un vestito* (*Seven Reeds, One Suit*), with music by Giovanni Fusco, or the remarkable productions directed by Ermanno Olmi from 1953 onwards for Edison, characterized by the sporadic use of music and the construction of a peculiar soundscape. However, it was from the end of the 1950s, with the initiatives of other industrial corporations, directors and collaborators, that the technological paradigm began to directly involve industrial communication, profoundly changing some of the main features of industrial film.

The pragmatic aspects played a considerable role in this transformation. As a consequence of the sustained economic growth, the main Italian private industrial corporations, along with some strategic state corporations including national centres for scientific research, decided to invest as never before in cinematographic communication, seen not so much as a production of commercials focusing on the end product, but rather as the means to promote the “corporate image” through the proposal of information or scientific-technological divulgation, stressing the social and cultural meaning of the industrial and technological progress. In these films the documentation of the preliminary steps – the conception and planning stage – as well as the various phases of industrial production come to the fore. In directly producing or commissioning films, the industrial corporations had the possibility of making use, for a certain period, of state subventions and funding, enforcing their investment capabilities determined by the Italian economic growth. Among the consequences of this favourable context, the production of films in this specific sub-genre of documentary really took off, reaching a peak in 1964, just before a law was passed denying access to public funding for industrial film production, resulting in a decline of the genre in quantitative terms [11] [12].

In such a context the artistic aspirations of the leaders of corporations producing high technologies favoured the cooperation of film directors and artistic collaborators that were active in the artistic avantgardes. The result of these collaborations emerges in films characterized by a high degree of audiovisual experimentation. The number of such films during the 1960s led me to propose the idea of an ‘experimental’ sub-genre of Italian industrial film, emerging in 1959, developing in the first half of the 1960s, attaining new vitality around 1968, and going into a rapid decline, though rare productions can be detected until 1973 [13].

Audiovisual Experimentation and the “Technological Paradigm”

Among the “experimental” sub-genre of the Italian industrial film, sound and music were involved in a profound transformation. The first examples produced a deep impact on the subsequent cinematographic production considered as a whole. What is interesting is the fact that such a transformation represents at the same time the consolidation of a “technological paradigm” in film music. Cinema is in itself strongly based on technology. In order to meet the needs of the industrial documentary, a high

degree of technology is requested: the difficulties posed by extreme conditions of light need an accurate use of filters; the techniques of photography and shooting can involve a large range of possibilities, from aerial shooting to macro-photography; it is usual the resort to drawings and animations. Compared to such an extended use of devices for the images, the traditional orchestral scores might appear all the more anachronistic. This could be one of the reasons that encouraged – in general – sound and music to conform to technological innovation.

In 1959 both the National Centre for Nuclear Research (CNRN) – then National Centre for Nuclear Energy (CNEN), now National Agency for New Technology, Energy and the Environment (ENEA) – and Olivetti produced or commissioned industrial films whose music was assigned to Luciano Berio, who since 1955 had been experimenting with electronic sound in collaboration with Bruno Maderna and others at the Studio di Fonologia Rai in Milan. The CNRN film *Ispra 1* (Gian Luigi Lomazzi, 1959) was designed to inform about the Italian efforts concerning nuclear energy as they were developed in the new laboratories of nuclear research and fusion in Ispra, near Varese (it was the first Italian nuclear reactor, realized on American project). The two Olivetti productions directed in 1960 by Nelo Risi – *Elea classe 9000* (*Elea, series 9000*) and *La memoria del futuro* (*Memory of the Future*) – concerned the construction of the first computing machine completely based on transistors (computer was named Elea 9003), at the same time illustrating in full detail the history of computing systems and underlining their importance for human progress.

For *Ispra* Berio used almost exclusively electronic and concrete sound, that is, tape music. For *La memoria del futuro* he used almost exclusively avantgarde instrumental music. On the contrary for *Elea* he composed both electronic and instrumental music (accurately avoiding the usual stylistic canons of “film music”) in order to combine through overdubbing, in some passages, electronic modules and musical cues from the recorded instrumental score. Though not an isolated case, the combination of both typologies of sound production was unusual: until 1965, though present in the same film, electronic music and instrumental scores were generally used separately.

Beyond the specific compositional choices, the association between the representation of “new technologies” and electronic music became a practicable path, and other composers could follow the example, as happened in the 1960s. After 1959 Berio himself collaborated in very few film productions: in 1963 he collaborated with Bruno Munari in some short art and abstract films, where sequences shot in contemporary art exhibitions, as in *Arte programmata* (*Programmed Art*), or abstract coloured lights and forms, as in *I colori della luce* (*The Colours of Light*), were accompanied only by music, excluding comments, dialogues and any other sound. However, both the forementioned CNRN and Olivetti films had great resonance, to the extent that *Elea classe 9000* won the prize for the best industrial film in the competition regularly held in those years during the prestigious Venice Film Festival. In the field of industrial film, since 1959 electronic music became the sound of technological innovation and scientific research, and in particular the sound of nuclear energy, chemical analysis, electronic computing, automation, and was ready to pass into Italian auteur cinema – starting from Michelangelo Antonioni’s 1964 film *Deserto rosso* (*Red Desert*) – with these and other connotations [14].

The radical change emerges from the comparison between a scientific 1958 film produced by the U.S. Atomic Energy Commission (AEC) as an integral part of the series *Atom for peace* and *Ispra 1* (1959), both illustrating the peaceful uses of nuclear energy. The sound

design is completely different. In the first case the usual orchestral music dominates: the curves of the cathode rays of an oscilloscope is imitated by the music through a melodic oscillation of the thin sound of a flute [0:00:14-0:00:30]. In the second case, starting from the head titles, the sound design taken as a whole shares with the represented contexts precisely the “technological paradigm”: electronic and concrete sound, through the means of tape, were based on a technology introduced in Italy in 1955 – even if the Studio di Fonologia in Milan followed very high standards, to the extent that it was in competition with the most advanced centres in Europe: Paris and Cologne. The association relied on the objective similarity between the electronic devices used in the analysis of data and those used for the production of electronic sound. The similarity enforced the association, which shortly involved recurrence, developing *topoi* that were properly “new”, and this not only because they emerged directly as audiovisual *topoi*, but also because they relied on a technology which was pure avantgarde.

While the representation of heavy industry and particularly the most spectacular phases of steel work, from *Acciaio* onwards, made use of timbral homogeneity triggered by the use of percussion and brass instruments (a *topos* which is still extensively used today), the most advanced scientific and industrial technologies of those years (based on nuclear physics, informatics and electronics) could rely on homogeneity at different levels: not only timbral (I refer to the sounds that were generally produced by instruments of measure and analysis) but even material, structural and technological.

Recurrence and Consolidation of Audiovisual Topoi during the 1960s

During the 1960s the recurrence of such associations consolidated their relationship with particular connotations of the semantic field, producing shared audiovisual *topoi* as well as encouraging sophisticated artistic constructions.

One of these was the recurrent association between comments of the speaker concerning the dangers and risks for men’s health or safety (the risks of radioactivity, nuclear destruction, environmental pollution and so on), images exhibiting signals of danger (a very direct and meaningful communication instrument) and electronic sound. The last is often characterized by very high, even disturbing frequencies along with prolonged sound, sometimes characterized by a gradual or even a sudden increase in intensity. It is not by chance that such associations occur repeatedly in the films produced by CNEN or ENEA, whose communicative strategy was since the very beginning that of admitting the risks and the dangers connected to nuclear energy – these were, rather, at the centre of the discourse.

In the head titles of the film *Atomi puliti (Clean Atoms)*, directed by Enrico Franceschelli in 1965, with the musical collaboration of Franco Potenza – a neglected Roman composer, very active both in the field of popular music (he was the director of the choir at the Sanremo Festival from its introduction in 1960) and avantgarde composition as well as cinema – we hear piano music combined with a long continuous sound whose timbre is hard to identify; the music is synchronized with the shooting of a stream ending in a small waterfall. After the head titles the words in the comment of the speaker concerning the environmental damages produced by pollution – a consequence of industrialization – coincide with the emergence of electronic sound, that now, during a long pause in the piano, we realize was present from the beginning of the film. The tension of electronic sound increasingly grows when the shoots focus on the building of a factory, with a long

chimney against a grey sky, coloured by the smoke of industrial production [0:00:00-0:00:45]. Then the contemplation of disasters is stressed by electronic sound becoming a more and more scary presence, reaching a climax in the subsequent section, illustrating atomic power in its destructive values, as shown by the atomic bomb on Hiroshima.

The end of the film insists on the images of nuclear waste deposits: a number of blue and red nuclear drums exhibiting the well-known symbol of radioactivity: black three-leafed clover on a yellow field. In this sequence – after a section where electronic sound became a harmonic and pleasing background – the film gradually returns to a different sound, increasingly more disturbing and even threatening, until an electronic shiver of terror, synchronized with the black screen, concludes the film. Here sound transforms into a threat the risks that the words of the speaker tend to minimize [0:10:23-0:10:42].

At the end of the 1960s, after a ten-year development, we encounter experimental films showing a conscious and even sophisticated use of *topoi* involving electronic music, with results of great audiovisual impact. A noticeable example is the Innocenti film *Noi continuiamo* (*We Are Continuing*), directed in 1968 by Mario Damicelli, with the musical collaboration of Egisto Macchi, one of the founding members of Nuova Consonanza. This film capitalizes on the recurrence of audiovisual structures triggering signification processes that offer very simple and immediate effects. In a passage [0:13:28-0:13:50] the words “analisi chimiche” (“chemical analysis”), pronounced by the speaker while details of beakers, microscopes, X-ray devices and oscilloscopes appear, are strictly synchronized with the entrance of electronic sound, which up until that point had been quite marginal.

Yet a very complex *topos* emerges in the same film, showing how, even in the age of the audiovisual and of technology, the traditional rhetoric figures can play both a constructive and interpretative role. This is a composed *topos* inspired by the idea of “montage”. In the theory of *loci communi* we experience a figure resembling the old *locus notationis*, that is, triggered by the different meanings assumed by the term “montage” – or at least by the Italian term “montaggio”, characterized by the wide range of precise, even technical, connotations. At the same time this is an outstanding application of the figure that old theoreticians would have named *locus totius et partium*, and that I would re-define as structural correspondence between the represented object and the modalities of its representation. In order to understand the convergence of these two figures, it has to be said that electronic and concrete music share with pre-digital cinema the technology of recording, that is the magnetic tape and the technique of manipulating, through cut and montage, the recorded sound.

Many times, in this industrial film, the speaker gives way to pure audiovisual construction through extended montage sequences that are in effect abstract – to the extent that the workers, who in reality were always present in the assembly line, are basically suppressed, or at least become anonymous, in order to give the impression of prevalent if not complete automation. An outstanding experimental sequence is involved in the *topos* [0:18:30-0:21:20].

The previously mentioned rhetoric figures derive from the convergence of the following elements: the represented object is the assemblage (“montaggio” in Italian) of a car on an assembly line (“catena di montaggio”); the moving images are organized through montage sequences based on masterful video editing (“montaggio”); the sound corresponds to the same concept, given that it is the product of the cuts and montage (“montaggio”) of a magnetic tape, constructed for the purposes of an exact correspondence with the syntax of the

video editing, that is, using strict or punctual synchronization; the tape is at the same time a collage of instrumental music, electronic and recorded sound, becoming one and the same under the concept of concrete music – the noises of industrial production (recorded, transformed, manipulated and to some extent becoming abstract sounds) have been inserted in the soundtrack, which mainly contains synthetic sound. In other words, a highly technological and elaborate montage process is represented through a highly technological and elaborate montage process, combining two separate “horizontal” montages (in the moving images and in the soundtrack) in the “vertical” montage achieved through synchronization [15].

Not only, here, do signifier and signified converge, but the audiovisual structure refers to the same semantic field correlated to the *topos*. The technological paradigm, shared between represented object and modalities of representation, has been consciously highlighted in its constructive capabilities.

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