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A Music Semiotic Perspective on the Italian Industrial Cinema of the Economic Miracle: The Technology Paradigm and the Modes of Audiovisual Representation¹

Interdisciplinary Statement

Although moving from the critical examination of methodological perspectives arisen within musicological research, this essay intends to encourage the development of an interdisciplinary approach to film studies. This entails not only underlining the structural peculiarities of audiovisual texts compared to musical texts, nor only taking into due consideration the contexts of cinema production, but also, and mainly, drawing methodological indications from conflicting disciplinary perspectives, in order to attain in-depth theoretical awareness. In this discourse I shall be guided by a nominalist criterion, according to which disciplines exist solely as class names of actual subjects (individual scholars), each one participating with a different disposition and with a characteristic sensibility; this is why disciplinary boundaries may sometimes appear as unassailable ramparts, and other times as areas of mutual permeability favouring confrontation. Now, a common study object tends to undoubtedly increase the conflict between the standpoints of cinema scholars and musicologists who make cinema their field of examination. Yet this is a necessary requirement for a fruitful interdisciplinary comparison, aimed at delving into the reasons for divergence rather than leaving them unexplored.

In this case it is only normal for cinema scholars to blame musicologists for emphasising the role music and sound play, to the detriment of their interac-

¹ I would like to thank Elena I. Testa from the Archivio Nazionale Cinema d'Impresa in Ivrea for her cross checking work on the text.

tion with the remaining elements of the film, or for concentrating too much on texts and on the analysis of how they work, to the detriment of the contexts of film production; and vice versa for musicologists to blame cinema scholars for not dealing enough with sound and music, or at least for not dealing with them properly or with the necessary knowledge, or for giving excessive attention to contexts and production systems to the detriment of texts. It is not even that important that they are unfounded prejudices or mere mutual expectations likely to be retracted. In fact, there is something to be said even for prejudices, since they allow us to surmise the heuristic criteria this interdisciplinary perspective has to follow, in order to actually become feasible, thus encouraging a less partial approach to an irreducibly complex subject.

Such a complexity reflects in the use of terms, which are connected to the historical development of each discipline. Terminology, indeed, may be used in a coherent way only within a specific sense configuration, and the historical development of a disciplinary field undoubtedly contributes to convey relatively stable semantics. Terminologies, however, are not only facilitating tools, but also «Denkmäler von Problemen», quoting an illuminating definition by Theodor Adorno². An interdisciplinary comparison actually shows the problematic aspects of terminologies. In different disciplinary fields the same term may, indeed, refer to completely different concepts, creating misunderstandings which, should they not be clarified, are destined to hinder mutual comprehension and thus the very chance of dialogue. This is what happens with the term “text”, hence the adjective “textual” and the substantival form “textuality”, which in the various approaches to cinema may refer to diverse concepts, each one dominant in a specific disciplinary field.

We may distinguish two concepts of textuality used in the audiovisual field: a “material/structural” textuality, which goes back to historical and philological disciplines and widely prevails in musicological approaches, and a “semiotic/functional” textuality, which prevails among film and media scholars. The former identifies the audiovisual text on a material format (the celluloid film in pre-digital cinema) endowed with structural coherency. Such a coherency is based on two levels of recording – the moving image and the sound, both technologically reproducible – and on a range of procedures which can be connected to editing and synchronisation³. The latter

² Theodor W. Adorno, *Philosophische Terminologie. Zur Einleitung*, 2 vols., edited by Rudolf zur Lippe, Frankfurt am Main, Suhrkamp, 1973-1974, vol. 2, 1974, p. 13.

³ This conception is clearly explained in Gianmario Borio, *Riflessioni sul rapporto tra struttura e significato nei testi audiovisivi*, «Philomusica on-line», VI, 3, accessible on: <http://riviste.paviauniversitypress.it/>.

considers texts first as meaningful and communicative objects with a range of implications⁴; in other words, they consist of groups of pertinent, coherent and consistent traits, which are organised around semiotic functions. This concept may in turn be structured according to two perspectives: “symbolic/communicative”, identifying specific semiotic functions in the text, and “pragmatic/contextual”, which explains the text as a function of the contexts it necessarily arises in (production, media, distribution and reception systems). A naive use of the term, so as to induce a substantial identity of the concept, would clearly expose to the risk of deep misunderstandings. On the contrary, the assumption of a clear theoretical demarcation between diverse concepts of textuality would allow to propose a possible interaction on the analytical level, thus favouring interdisciplinary dynamics.

Now, in apparent contradiction to the approach previously outlined, I am forced to distinguish the perspective of “music semiotics” which emerged in the field of Anglo-American musicology from semiotics as an autonomous discipline. By doing so I am following the observations made by scholars, who in varying degrees and in different times have motivated this distinction. In an essay published at the end of the 1980s, Jean-Jacques Nattiez started with a radical assertion:

Semiotics does not exist. For two closely related reasons: the investigations which, since the end of the nineteenth century, have claimed to be semiological take their inspiration from diverse orientations and have an extremely varied scientific past; as yet nobody seems to have put forward a sufficiently coherent paradigm for analysis, or a corpus of universally accepted methods, which would enable one to talk of a *single* semiological science⁵.

This situation was minutely described in this long essay by Nattiez, who offered a convincing theoretical-methodological account of the disciplinary uncertainty which characterised what he called music “semiology”. His verdict is still valid today. Indeed, although semiotics *per se*, in the meantime,

⁴ This view is evident in Francesco Casetti, *Il testo del film*, «Comunicazioni sociali», I, 3, 1979, Fr. transl., *Le texte du film*, in *Théorie du film*, edited by Jacques Aumont and Jean-Louis Leutrat, Paris, Albatros, 1980; more briefly in Francesco Casetti and Federico Di Chio, *Analisi del film*, Milano, Bompiani, 1990, p. 8.

⁵ Jean-Jacques Nattiez, *Reflexions sur le développement de la sémiologie musicale*, in Id., *De la sémiologie à la musique*, Montreal, Université du Québec à Montreal, 1988, pp. 189-234, Engl. transl., *Reflections on the Development of Semiology in Music*, «Music Analysis», VIII, 1-2, 1989, pp. 21-75: 21 (emphasis in the original).

has undoubtedly achieved a more defined disciplinary stature, we may easily state that this has not measurably affected “semiotic” investigations, which have been carried out in musicology in the past twenty-five years. By “music semiotics” we still mean a musicological approach which may create diverse and arbitrary relations with theoretical requirements, methodologies, terminologies, authors and texts variously referring to “semiotics” as a discipline. Giles Hooper has summarised this situation in the concluding paragraph of a recent article:

[...] it is not so much that Anglo-American musicology does not ‘do’ semiotics, but more that Anglo-American musicology has rarely chosen to ‘start out’ from semiotics: rarely, in other words, has semiotics provided Anglophone scholarship with the fundamental or systematic framework within which it operates or the working vocabulary by means of which it consistently expresses itself. However, despite this fact – which has historically rendered semiotics, as an explicit and bounded disciplinary field, superficially marginal to Anglo-America music scholarship – it is the underlying and motivating impulses of semiotic inquiry that are now, in a transformed and synthetic context, proving to be of central importance to the very same⁶.

This induces to carefully examine the relation each single “semiotic enquiry” has with the discipline it most of the times merely borrows only its name from.

In spite of these precautions, the following examination may still seem surprising: first, because it deals with the semiotic enquiries of the Anglo-American musicology with the sole purpose of discussing the preconditions of their application to the audiovisual domain; second, because it offers a partially new “semiotic” perspective in such a field as film studies, where other kinds of semiotic approaches are widely prevailing. Therefore, I shall explain in detail – also in light of the previous distinction between audiovisual or cinema concepts of textuality – the specific goals and characteristics of the music semiotic perspective hereby surmised.

⁶ Giles Hooper, *A Sign of the Times: Semiotics in Anglo-American Musicology*, «Twentieth-Century Music», IX, 1-2, 2012, pp. 161-176: 176.

A Semiotic Approach to Music

Created with the intention of focusing on relevant aspects of musical signification in musicological enquiry, where the attention of specialists used to be directed at the analysis of internal connections of works conceived within an aesthetics of autonomy, music semiotics or “semiology” initially drew on structuralism. Nattiez introduced and developed this outlook, offering a systematic formulation in the very moment when the study of musical signification started to move toward a reassessment of its methodological requirements⁷. This change of perspective took place within Leonard Ratner’s circle, who in his seminal study on classical music⁸ paved the way to recognising units of signification – the “musical topics” – based on the “referential” connection between specific musical configurations (or structures) and the (historical, social, political, cultural) contexts, considered as “extra-musical” correlates. This sort of music semiotic enquiry was initially defined and developed only in relation to classical composition by other scholars: besides Wye Allanbrook⁹, it was mainly Kofi Agawu who established the so-called “topic theory” tradition¹⁰. Once more, this happened in terms of “structuralism”, in part relying on Ferdinand de Saussure’s linguistics and in part on the idea that semantics should be based on musical structures ultimately ascribable to syntax and harmony, which is prevailing in the field of musicological research. This approach to music was mainly aimed at recognising the presence of “topics” in musical works from the classical period, with a twofold goal: on one hand, catalogue and organise them in a taxonomic system gradually expanding in the years, on the other, explain how they work through an evaluation of the relation between expressive surface and syntactic structure. The expressive surface has an indirect and not fully clarified relation with the formal organisation, as it is confirmed by the aporetic result of William Caplin’s investiga-

⁷ Cf. Jean-Jacques Nattiez, *Musicologie générale et sémiologie*, Paris, Bourgois, 1987, Engl. transl., *Music and Discourse: Toward a Semiology of Music*, Princeton, Princeton University Press, 1990.

⁸ Cf. Leonard G. Ratner, *Classic Music: Expression, Form and Style*, New York, Schirmer Books, 1980.

⁹ Cf. Wye J. Allanbrook, *Rhythmic Gesture in Mozart: Le nozze di Figaro and Don Giovanni*, Chicago, University of Chicago Press, 1983.

¹⁰ Cf. Victor Kofi Agawu, *Playing with Signs: A Semiotic Interpretation of Classic Music*, Princeton, Princeton University Press, 1991. Recently Agawu has turned to romantic tradition, including Gustav Mahler (V. Kofi Agawu, *Music as Discourse: Semiotic Adventures in Romantic Music*, Oxford and New York, Oxford University Press, 2009).

tion on the relation between formal functions and “musical *topoi*”¹¹, thus using the alternative Greek term for “topics”.

The subsequent development of “topic theory” is connected to the names of Robert Hatten and Raymond Monelle. In a recent article assessing the internal evolution of this music semiotic tradition, Nicholas McKay refers to these authors as a “second generation” of scholars who, in opposition to the developments of so-called “new musicology”, have maintained a more traditional formulation: their works, indeed, show a constant effort «to situate interpretation in a topically-informed *historical* context»¹². From a theoretical-methodological point of view, however, one must point out that these authors, too, have continued to variously draw from the developments of linguistics, which have preceded and then helped establish semiotics as a discipline, rather than from theoretical orientations actually ascribable to semiotics *per se*. Of course “music semiotics” is different from the formulation of linguistics in some essential points. For instance, it replaces the concept of “referent” (the denoted object of the linguistic sign) with that of semantic “correlate”, so as to emphasise the specific musical signification, especially when there is no poem set to music, no dramatic context, no title nor programme. However, in choosing the theoretical reference points each scholar follows a personal course, according to the demands of the empirical goals in one’s specific musicological examination.

Hatten’s music semiotics emerged as an extension of the “markedness theory” – stemmed from Roman Jakobson’s linguistics and assumed in Noam Chomsky’s generative grammar – to the musicological field and has been almost exclusively applied to Viennese classical style (Haydn, Mozart and Beethoven) and its immediate developments (Schubert). According to Hatten, musical signification is triggered by the relation between “marked” and “unmarked” elements, that is: by the connection between a “normal” use, or at least accepted as such in a given stylistic context (“unmarked”), and the degree of deviation from this very use (“marked”)¹³. Hatten has then established or at least reinforced a distinction between musical signification levels, articulated in “gestures”, “topics” and “tropes” (i.e. combinations of different topics, genres and forms), which represent the tools of his analytical applications, characterised by the intention of fully appraising the semantic aspects

¹¹ Cf. William E. Caplin, *On the Relation of Musical Topoi to Formal Function*, «Eighteenth-Century Music», II, 1, 2005, pp. 113-124.

¹² Nicholas McKay, *On Topics Today*, «Zeitschrift der Gesellschaft für Musiktheorie», IV, 1-2, 2007, pp. 159-183: 173 (emphasis in the original).

¹³ Cf. Robert S. Hatten, *Musical Meaning in Beethoven: Markedness, Correlation, and Interpretation*, Bloomington and Indianapolis, Indiana University Press, 1994.

of instrumental music, yet always placing the basis of interpretation on the level of musical structures¹⁴. These applications have been explicitly criticised by Nicholas Cook, who has claimed that semiotic analysis in Hatten's sense after all belongs to tradition and that from this perspective "meaning" ends up seeming as «a kind of a supplement to formal structure»¹⁵. However, the emancipation from structural analysis does not seem to be an end consciously pursued by the methodological approach of topic theory; without a structure it would not even be possible to identify the specific signification units. On the other hand, this particular type of research would profit from a more clear distinction between "topic" and "*topos*", referring only to the latter as a specific symbolical recursive configuration with its own "structure", whereas the former should indicate only a general theme implied by the context, instead of a specific signification unit, as Ana Stefanovic has recently remarked¹⁶.

Monelle's approach bears a very broad theoretical speculation, and it has developed beyond the field of classical music, with forays into Romanticism and Modernism¹⁷. Recently, Monelle went even further, challenging the disciplinary status of musicology in favour of a historical approach to cultural phenomena which goes beyond a strictly musical dimension¹⁸; in doing so, he turned to cultural studies, enormously simplifying the theoretical framework. Monelle thus went back to the old articulation of sign according to the two fronts postulated by Saussure: "signifier" and "signified"¹⁹. This can be clearly seen in the structure of his discourse, which does not seem to be affected at all by the preference expressed for Charles Peirce's tripartite model, which based every signification processes on the relation between three elements: "representamen", "object" and "interpretant"²⁰. This formulation would emphasise the observer's key role, who through an intentional subjective and inconstant act ("interpretant") creates a connection between

¹⁴ Cf. Robert S. Hatten, *Interpreting Musical Gestures, Topics and Tropes: Mozart, Beethoven, Schubert*, Bloomington and Indianapolis, Indiana University Press, 2004.

¹⁵ Nicholas Cook, *Review-Essay: Putting the Meaning back into Music, or Semiotics Revisited*, «Music Theory Spectrum», XVIII, 1, 1996, pp. 106-123: 111.

¹⁶ Cf. Ana Stefanovic, *Once More on Musical Topics and Style Analysis*, «Zeitschrift der Gesellschaft für Musiktheorie», VII, 3, 2010, pp. 311-325: 323-324.

¹⁷ Cf. Raymond Monelle, *The Sense of Music: Semiotic Essays*, Princeton, Princeton University Press, 2000.

¹⁸ Cf. Raymond Monelle, *The Musical Topic: Hunt, Military and Pastoral*, Bloomington and Indianapolis, Indiana University Press, 2006.

¹⁹ *Ibid.*, pp. 20-32.

²⁰ *Ibid.*, p. 24.

the mental representation of the sign which has to be interpreted (“representamen”) and the object that representation refers to (“object”). Monelle actually did not make any practical use of Peirce’s tri-partition, insofar as his studies were organised according to completely separate parts: one devoted to the “signifier”, where he analysed the musical structure of specific signification units, and the other devoted to the “signified”, where he examined the historical, social and cultural context the actual musical structure refers to.

Now, a rigid distinction between signifier and signified represents at the same time a general limit of topic theory. That divide would deserve to be rethought simply because a certain musical structure at the base of a signification process may activate such process, and thus refer to a context, only if a sufficient number of properties and musical features are an essential part of the context. The musical structure, therefore, is at the same time the “signifier” and part of the “signified”, since at least some aspects of that structure (i.e. musical aspects) help define or at least connote the context where it usually occurs. The signification process itself, however, cannot be identified in its structure nor its context, but in the symbolical investment through an intentional bestowal of sense, which can be activated either in the author’s explicit intentions or in the receptive capabilities of the recipients within a communicative act. Therefore, it is up to historical research, and not to theory, to define the semantic characteristics of each occurrence of a given musical structure in a given historical context. From a theoretical point of view, we cannot go beyond acknowledging the hermeneutical circle, which is produced between the occurrence of a given musical structure in a text (or in a performance) and the occurrence of a similar structure in the context defining its correlate.

Another limit of the topic theory approach can be identified in the tendency to an essentialist concept of the *topos*, which is usually – and sometimes explicitly – equated with an abstract entity, largely independent from the historical contexts where it occurs. Such tendency is encouraged, on one hand, by the historical persistence of semantic fields and reference contexts, and on the other hand by the failed theoretical distinction between *topos* and topic. Moreover, what reinforces the essentialist vision is the preference scholars have shown so far for the analysis of long-term *topoi*, featuring simple musical structures, actually more resistant to change, referring to contexts which have long been musically defined. However, we must acknowledge the possibility that scholars decide to focus on the historicity of *topoi*, and to argue the difference, instead of welcoming every time the more or less “eternal” return of the identical. Each use of a certain *topos* entails a negotiation between

different instances, including not only the author's conscious intention, the receptiveness of the audience and the different typologies of "recipient", but also the various cultural institutions dealing with the dynamics of reception (genres, styles, production and distribution systems, economical, political and social instances).

Topic Theory and Film Studies

In introducing the main features of topic theory I focused the attention on some limits, not because they are intrinsically problematic – problems are still containable until we keep to the strict musical field –, but because of the inescapable difficulties arising as we turn our attention to the dynamics of musical signification in audiovisual texts. Insofar as the distinction between signifier and signified is concerned, it must be said, indeed, that film shots are able to represent objects and contexts in full detail, thus leaving little room to imagination; they "exhibit" the semantic fields directly in the audiovisual structure, forcing the scholar to reconsider or completely overcome this rigid demarcation. Moreover, compared to musical works and other traditional artistic fields, the historicity of audiovisual products is much more "radical", not allowing to linger on an essentialist vision. Cinema, indeed, already before sound was introduced, has marked the change from artisanal conditions typical of traditional art forms to industrial conditions, based on division of labour. This determined a considerable increase in the quantity of products released on the market and in the distribution network, making the recurrence of audiovisual structures referred to ever-evolving semantic fields much more frequent. Cinema thus came to offer a favourable ground both to reuse *topoi* previously created in other art forms (music, theatre, literature, painting) and to create new *topoi*, whose development appeared to be all the more easily observable, as the pace at which audiovisual products were released in the distribution network increased. A similar increment affected the number of consumers, because of the commercial distribution system. For these reasons communication in cinema was of decisive import, encouraging the use of *topoi* in all the components of film: dialogues, photography, shooting, sound effects, noises, music.

If we consider the role of music and sound in the audiovisual field, the study of *topoi* may fruitfully develop in three directions: analyse how a certain traditional musical *topos* is used and reused in audiovisual communication through "remediation" practices, explore the practical purpose musical *topoi* serve in the composition and improvisation of film music, or focus

on audiovisual *topoi* intended as recurring structures based on image-sound synchronisation in order to study the correlation with the semantic fields defined by the moving image.

In explaining the third and last direction I have introduced the concept of audiovisual *topos*, with which I intend to explore from a “semiotic” point of view what the literature on cinema so far seems to have overlooked. The only thorough study on recurring elements in narrative cinema is Jörg Schweinitz’s work, which constantly avoids the term “*topos*”, preferring “stereotype”. In his analysis this scholar refers solely to visual aspects in cinema, explicitly setting sound and musical aspects aside. More precisely, he only infers the existence of stereotypes in the sound component, asking specialists with musical knowledge for closer examination²¹. This is an explicit acknowledgement of a partial and incomplete approach to cinema which still prevails, thus confirming the pressing need for an interdisciplinary debate.

This debate may even take the form of interaction between the different concepts of textuality previously stated, which allows me to extend the relation between a certain structure and a related semantic field also to the audiovisual domain, in keeping with the musicological perspective of topic theory. For the explanation of audiovisual structure I refer to three scholars: Michel Chion, who probably was the first to aptly emphasise the structural sound-image relation in cinema and other audiovisual forms²²; Nicholas Cook, who concentrated on audiovisual products in which music played a dominant part, which he defined «musical multimedia»²³; Gianmario Borio, to whom we owe a recent definition of audiovisual textuality²⁴. These authors intend textuality according to the concept referred to as “structural/material”. As for the other – “semiotic/functional” – concept of textuality I mainly refer to the explicitly anti-essentialist approach

²¹ Cf. Jörg Schweinitz, *Film und Stereotyp. Eine Herausforderung für das Kino und die Filmtheorie. Zur Geschichte eines Mediendiskurses*, Berlin, Akademie Verlag, 2006, Engl. transl., *Film and Stereotype: A Challenge for Cinema and Theory*, New York, Columbia University Press, 2011, p. 62. Here the author refers to occasional speculations in: Barbara Flückiger, *Sound Design. Die virtuelle Klangwelt des Filmes*, Marburg, Schüren, 2002, p. 182; Barbara Flückiger, *Sound Effects. Strategies for Sound Effects in Film*, in *Sound and Music in Film and Visual Media: An Overview*, edited by Graeme Harper, Ruth Doughty and Jochen Eisentraut, London, Continuum, 2009, pp. 151-179: 160.

²² Cf. Michel Chion, *L'audio-vision. Son et image au cinéma*, Paris, Nathan, 1990, Engl. transl., *Audio-Vision: Sound on Screen*, New York, Columbia University Press, 1994.

²³ Nicholas Cook, *Analyzing Musical Multimedia*, Oxford and New York, Oxford University Press, 1998.

²⁴ Cf. G. Borio, *Riflessioni sul rapporto tra struttura e significato nei testi audiovisivi*.

to film genres introduced by Rick Altman. We must, in fact, consider that the concept of genre – though more complex and multi-layered – shares with the concept of *topos* an essential characteristic, that is, being based on the recurrence of semantically defined textual functions. Moreover, Altman has suggested a synthesis of the different types of semiotic textuality, thus defining a «semantic/syntactic/pragmatic approach»²⁵. Within film industry the pragmatic aspects actually play an important role. The very chance of activating audiovisual signification processes mainly depends on historical, social and cultural contexts which provide a *topos* with its characteristic semantic connotations.

Another aspect I shall take into consideration in the analysis – once more connected to topic theory – is the role played by rhetorical organisation, which may at times involve “rhetorical figures”. I here refer to rhetoric not according to a specific concept of textuality, but as a level of “formal” organisation – i.e. independent from its specific “content” – involving all textual levels: structural, symbolic and pragmatic. Particularly, the rhetorical moment triggers processes of text self-reflexivity both on a structural level and on a semiotic-functional level, whose results in the audiovisual and more specifically cinematic field are yet to be explored. Also in this way I intend to contribute to an interdisciplinary approach.

The Context of Italian Industrial Cinema

The semiotic perspective here outlined helps understand audiovisual signification processes, contributing to their historical analysis through the study of their reference context (the semantic field) and of recurring audiovisual structures, used in communication. In the following analysis I shall take into consideration audiovisual *topoi* relative to a semantic field, which only during the 20th century came to have socially and culturally relevant connotations: technology or more precisely the “technology paradigm” intended as a productive interaction of scientific research, technological innovation and industrial application. The perimeter of historical analysis is defined by film subgenre and chronological interval: indeed, I shall focus on Italian industrial film (a documentary genre) at the time of its *climax* – which actually coincides with the years of the so-called “economic miracle” (1958-1963) – and the immediately following period, which is still based on its implications.

²⁵ Rick Altman, *Film/Genre*, London, The British Film Institute, 1999.

It may be useful to remind, following Paul Ginsborg's classic study²⁶, the factors which started the great economic growth, helped by a rapid industrialisation, which profoundly altered the social, productive, cultural and environmental fabric in post war Italy. The Marshall Plan (1947-1951) acted as the first incentive with a considerable injection of cash, machinery and American technologies. In the following period (1951-1958) the economic growth was spearheaded by internal demand. Along with metalwork, petrochemical and steel work industry, these circumstances were particularly advantageous for the white goods and automotive branches, headed by FIAT. Building a modern assembly line of considerable proportions (1953) caused a decrease in car prices, which favoured in the following years mass motorisation. However, what started the actual "economic miracle" was the end of protectionism and opening to the European market, where Italian industries proved to be very competitive. Different factors favoured this aspect, which determined an exponential growth in export: technological development, productive diversification, hydrocarbon availability, favoured by the competition between ENI, Edison and Montecatini, the freedom the entrepreneurs enjoyed because of weak workers' unions, a favourable discount rate guaranteed by the Bank of Italy; indeed, they all concurred in keeping labour cost low. In this frame, one must consider the success of an innovating factory like Olivetti, which produced typewriters along with research on most advanced electronic calculators; a technology which around 1958 led to build and perfect the first transistor computers. In the same years research on nuclear energy was a technologically developed branch, sponsored by the Comitato Nazionale per le Ricerche Nucleari (CNRN), later called Comitato Nazionale per l'Energia Nucleare (CNEN) and finally Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA); with a significant endorsement from the United States, also in Italy research laboratories and nuclear fusion centres were soon created.

Such a multi-faceted perspective, full of promising innovations, developed a sense of break from the past, together with high hopes for the future. This perception was based on the observation that an epoch-making change was happening (from a mostly agricultural society, Italy suddenly became an industrial society, with macroscopic urbanisation processes and considerable internal migration) and it helped charge the technology produced by scientific research and put to use in the industry with a new meaning, which tied

²⁶ Cf. Paul Ginsborg, *Storia d'Italia dal dopoguerra a oggi*, Torino, Einaudi, 1989, Engl. transl., *A History of Contemporary Italy: Society and Politics 1943-1988*, New York, Palgrave Macmillan, 2003, pp. 210-253.

it even more to ideas like innovation, revolution, avant-garde. Technology was no longer at the service of war enterprise, like during World War II tragic years, but it served mankind and peace, envisaging a not only more economically prosperous future, but also a socially better one. Insofar as the role of cinema, it also experienced a hermeneutic circle hard to escape. These connotations of technology, indeed, are not only “registered” but also conveyed, encouraged, instilled and spread by contemporary media system (newspapers, radio, discs, cinema, television), which actively participated in shaping this context. Among them, industrial films hold a strategic position in those years.

A genre fostered in Italy since the early years of the century, industrial cinema had experienced soon after the advent of sound films, in the 1930s, an extraordinarily thriving moment. In 1933 *Acciaio*, one of the first sound films produced by Emilio Cecchi’s Cines, entirely shot in Terni steel plants, had set a very high standard of audiovisual experimentation, involving important collaborators: it was directed by Walter Ruttmann, who had worked since the 1920s with abstract cinema and was a restless experimenter in editing and synchronisation; the orchestra music was by Gian Francesco Malipiero, whose score had allowed the director some momentous audiovisual results (though criticised by the composer); the subject came from a novel by Luigi Pirandello (a weak plot, included in a film documenting and glorifying work and industry).

After World War II this genre was reborn from its ruins, with very limited means, in many instances conforming to the communicative – not obviously technological – standards taken from Hollywood films, whose success was favoured first by occupation and then by the economical help provided by the United States. These standards can be seen both from patrons’ intentions and from the soundscape. The usual “film music” as a stereotyped category takes over: a music for a large orchestra with wide sections of winds and percussions, the use of *Leitmotive*, dominant processes of thematic-motivic elaboration, expanded tonality, frequent resort to chromaticism, sense of apotheosis. All these musical procedures recall the classic-romantic and late romantic long tradition, often with forays into the language of modernism, and their functional use was obviously based on an actual system of musical *topoi*. There were, already at the end of the 1940s, examples of artistically finished industrial films, such as a 1949 short film, *Sette canne, un vestito* directed by Michelangelo Antonioni for SNIA, an industrial group manufacturing viscose, with music by Giovanni Fusco. During the 1950s major private industries (Edison, FIAT, Olivetti) were equipped with their own divisions for film producing, from

which some distinct authors stood out: Ermanno Olmi's refined and lavish production for Edison started in 1953, featuring a very peculiar soundscape, which, constantly eluding so-called "film music", makes a limited use of music and usually resorts to folk repertoires. However, in the wake of the 1960s other patrons, with the help of other directors and artistic collaborators, shall make sure the technology paradigm directly involves film communication, substantially modifying for many years the sound design and the very concept of Italian industrial cinema.

Experimental and Electronic Music Appears in Italian Industrial Cinema

The pragmatic aspects of industrial cinema play a considerable role in this change. In the years of the "economic miracle", profiting from the economic growth, the main private Italian industries (FIAT, Olivetti, Italsider, Innocenti), together with strategic public enterprises and scientific research national centres (ENI, ENEL, ENEA), decided to invest in an unprecedented way in cinema communication, not as a means to directly advertise finished products, but as a strategy promoting corporate image, based on scientific-technological information and popularisation, with a high premium on the social and cultural meaning of technological and industrial progress, where documenting the preliminary steps of design and research production processes was pivotal. In making their own or in commissioning films, industries could claim, for a certain time, state subsidies, which added to investment possibilities generated by the strong economic growth. Among the direct consequences of this favourable combination, there was an outburst of industrial cinema whose production climaxed in 1964, slightly before a law on cinema stopped state funding for corporate films, whose production had already dropped to almost half in 1965²⁷. In this context, however, the artistic aspirations of patrons connected with technologically advanced industrial realities favoured the involvement of film directors and artistic collaborators who were active in the avant-gardes, thus encouraging the production of

²⁷ For a general outlook on Italian industrial cinema see the following contributions, this critical reconstruction is based on: Elena Mosconi, *Il film industriale*, in *Il cinema a Milano dal secondo dopoguerra ai primi anni Sessanta*, edited by Raffaele De Berti, special issue of «Comunicazioni sociali», XIII, 1-2, 1991, pp. 61-90; Luigi Boledi and Elena Mosconi, *Il film industriale*, in *Un secolo di cinema a Milano*, edited by Raffaele De Berti, Milano, Il Castoro, 1996, pp. 295-311; Anna Maria Falchero, *Cinema e industria: i documentari industriali*, in *Quale modernità per questo paese. I documentari e le culture dello sviluppo in Italia. 1948-1962*, edited by Francesca Anania and Simone Misiani, special issue of «Storia – Politica – Società», XLI, 3-4, 2008, pp. 129-142; Giulio Latini, *L'energia e lo sguardo. Il cinema dell'Eni e i documentari di Gilbert Bovay*, Roma, Donzelli, 2011.

films with a high degree of audiovisual experimentation. Their considerable number has led me to introduce the idea of an “experimental” sub-genre in 1960s Italian industrial cinema²⁸.

Within this trend of Italian industrial cinema sound and music are involved in a change bound to produce a strong impact on subsequent cinematic production. The circumstance is all the more interesting since such a change reinforces the “technology paradigm” also in the cinematic world. Cinema already stands for technologically advanced context. The demands of industrial cinema are in this really high: conditions of extreme light, often prevailing, require an artful use of filters; photographic and shooting techniques range from aerial take, to tracking shot, to macro photography, to high-speed shot; the aid of drawings and animations is very common. In general, one must bear in mind that the technologies represented in most of these films were abreast of most advanced scientific research, therefore at the vanguard of post war scientific progress. In such a context the usual highly stereotyped orchestra scores conforming to Hollywood standards suddenly must have seemed anachronistic. Consequently, innovating productions – both from the point of view of shooting and editing techniques, and from the point of view of sound and music component – were encouraged.

In 1959 both the CNRN and Olivetti commissioned industrial films whose music was assigned to a forefront composer in the international avant-garde scene: Luciano Berio. The CNRN film *Ispra 1* (1959, by Gian Luigi Lomazzi)²⁹ examines the research regarding peaceful and civil use of nuclear energy, and especially the creation and activity of the first research and fusion laboratory designed for Ispra site, near Varese (*Ispra 1* was indeed the name of the first Italian reactor, built in quite a short time on an American project). Olivetti’s two films *Elea classe 9000* (1960, by Nelo Risi) and *La memoria del futuro* (1960, by Nelo Risi)³⁰ were about the creation of the first tran-

²⁸ Cf. Alessandro Cecchi, *Il film industriale italiano degli anni Sessanta tra sperimentazione audiovisiva, avanguardia musicale e definizione di genere*, in *Suono/Immagine/Genere*, edited by Ilario Meandri and Andrea Valle, Torino, Kaplan, 2011, pp. 137-159.

²⁹ This film is held at the Archivio Nazionale Cinema d’Impresa in Ivrea. It can be seen (last retrieved: September 2013) on ENEA web tv (<http://webtv.sede.enea.it/index.php?page=listafilmat2&idfilm=196&idcat=30>) under the title *Ispra: avamposto di pace*.

³⁰ Cf. Adriano Bellotto, *La memoria del futuro. Film d’arte, film e video industriali Olivetti 1949-1992*, [S.l.], Fondazione Adriano Olivetti, 1994, pp. 135-136, 166. The films are held at the Archivio Nazionale Cinema d’Impresa in Ivrea and available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>). I would like to thank Arianna Turci for pointing this out.

sistor computer (Elea 9003)³¹, but they also told the history of calculation systems, from the abacus on, to emphasise the key importance of electronic calculators.

In *Ispira 1* as well as in *Elea classe 9000*, Berio used both instrumental music for orchestra or ensemble – regardless of the rules of “film music” as a stylistic category dominating cinema communication – and electronic music, a general term I use here for “tape music” made with re-worked concrete sound and/or synthetic sound. In the case of *Elea classe 9000*, Berio displays some parts of instrumental music so as to combine, using overdubbing, instrumental recorded cues with electronic pieces composed at the RAI Studio di Fonologia in Milan³², which in the films are also used separately. Even if it is not an isolated case, this was no common choice: in film scores of the early 1960s (even beyond industrial cinema), indeed, the two ways of creating sound were usually destined to different sections in the film.

In order to clearly outline the peculiarities and the audiovisual impact of these Italian productions compared to the international ones, it is useful to make a comparison between an industrial film in four parts (*Atom for Peace*) produced by the U.S. Atomic Energy Commission and adapted for the Italian audience (*L'atomo al servizio della pace*, 1958)³³ and *Ispira 1*, produced a few months later and influenced by the same communication strategy: stressing the importance of the peaceful use of atomic energy. They show two completely different soundscapes. In the former, the opening credits are dominated by the usual “film music”. In the beginning of the fourth part of the American-produced film, soon after the opening credits, the cathode rays curves of an oscillograph are associated (and so to say “made audible”) at first with the melodic oscillation of the flutes, and then of other instruments (from 00'15”). This occurs within a sudden rarefaction zone, put into a score characterised by the extremely brilliant and thus “convincing” orchestration for the trust in the technologies shown. In the latter instance, the electronic sound is involved. The first minutes of *Ispira 1* are a mix of audiovisual associations evoking the contexts of nuclear energy production. While the shots of an analysis labora-

³¹ Cf. Giuseppe Rao, *Mario Tchou e l'Olivetti Elea 9003*, «Limes», 10 July 2008, available on the journal website (<http://temi.repubblica.it/limes/mario-tchou-e-lolivetti-clea-9003/571/>).

³² For information on the recording of electronic pieces see *The Studio di Fonologia. A Musical Journey 1954-1983. Update 2008-2012*, edited by Maria Maddalena Novati and John Dack, Milano, Ricordi, 2012, pp. 162-163, 172.

³³ The film is held at the Archivio Nazionale Cinema d'Impresa in Ivrea and available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>). It can be seen (last retrieved: September 2013) also on ENEA web tv (<http://webtv.sede.enea.it/index.php?page=listafilmcat2&idfilm=135&idcat=30>).

tory entirely occupied by an electronic calculator and the technicians at work (from 00'04" to 00'08") is already emphasised by introducing an electronic sound, the opening credits (from 01'17" to 01'55") are completely pervaded by it. For the shots documenting the construction of the reactor, starting from the first ground removal, the director chose Berio's orchestra music, playing in the background while the voice-over commentary has centre stage (from 01'56" to 03'48"). The electronic sound is back on once the laboratory set is framed again. After the speaker says «assistiamo a qualche esperimento» (03'50") the sound volume suddenly rises in correspondence with the detail of analysis equipment (04'07"). A little bit further, the shot of an oscillograph is synchronised with the sound produced by a similar measuring instrument (04'23"). This detail for one moment moves away from the prevailing soundscape, though not implying an actual change of paradigm. There is, indeed, an objective technological continuity between electronic calculators for data analysis and the equipment used for synthetic sound production. The shots returning to the machines (04'25") correspond to a return to Berio's electronic sounds. They especially emphasise the shot of a big diagram – the results on paper of electronic measurements (from 04'30" to 04'34") – like it had already been done in the beginning of the film, right before the opening credits (from 01'13" to 01'14"). The black three-leave clover which appears on a yellow background – a known symbol for radioactivity danger – is similarly introduced by the electronic sound (from 04'35" to 04'39"); in this case the symbol hanging on the door welcomes us into a laboratory filled with ampoules and measuring instruments, where the electronic sound is pervasive.

The on-going presence of electronic music does not allow us, in this case, to identify accurately the use of specific sound qualities. However, these audiovisual associations affected in a deep and lasting way the making of following Italian industrial films, thus becoming actual audiovisual *topoi*. They were necessarily “new” *topoi*, both because they were created already as audiovisual structures, and because they depended on sound production technologies which had been made available only since a few years. One must, in fact, consider that the Studio di Fonologia in Milan was set up in 1954, encouraged – and then directed – by Berio himself and Bruno Maderna. The studio followed very high standards, so that it could compete with the foremost European electronic music centres of the time: Pierre Schaeffer's studio at the Radiodiffusion-Télévision Françaises (RTF) in Paris (1948) and the Studio für elektronische Musik of the Nordwestdeutscher Rundfunk (NWDR) in Cologne (1953). Therefore, the studio's facilities were as much up-to-date as the technologies for nuclear energy portrayed in the Ispra film were.

One must not forget that Italian industrial cinema was connected to the overall international cinema world. Once again, in *Ispra 1* the speaker's voice comments at a certain point on the shot of a technician handling radioactive material through a glove box (from 05'12" to 05'15") with the following words: «l'operatore sembra un personaggio da film di fantascienza». This reference is no coincidence. The first fictional film with an entire electronic music soundtrack had been, indeed, a U.S. science-fiction movie, *Forbidden Planet* (1956, by Fred M. Wilcox), which emphatically announced from the very opening credits the presence of «electronic tonalities» by Louis and Bebe Barron. Among the very first systematic experimenters of concrete and electronic sounds, already in the early 1950s the Barrons had been involved in the audiovisual making of avant-garde abstract short films like *The Bells of Atlantis* (1952, by Ian Hugo), *Miramagic* (1954, by Walter Lewisohn) and *Jazz of Lights* (1956, by Ian Hugo). John Cage had also used their studio for his first composition on tape, *William Mix* (1952); then Cage asked them to take part in his experimental music projects³⁴. To us, however, the fact that in the 1960s the Barrons were involved in a scientific-industrial production by Western Electric as well – *Quartz Crystal Growing* (1962, by Jeri Sopenan)³⁵ – is most important.

As for Berio, he later would have only seldom committed to cinema, writing the music exclusively for a few artistic experimental short films, consisting only in the association of music and images, that is, completely deprived of other sound elements like noises or dialogues. The collaborations with Bruno Munari and Marcello Piccardo's Studio di Monte Olimpino belong to this period: Berio was commissioned the music for *Arte programmata* (1963, by Enzo Monachesi, on behalf of Olivetti)³⁶ and *I colori della luce* (1963, by Munari and Piccardo, on behalf of the Centro Internazionale Arte e Costume in Milan)³⁷. Yet the industrial films with Berio's music did not go unseen: namely, in 1960 *Elea classe 9000* was even awarded with the prize

³⁴ Cf. James Wierzbicki, *Louis and Bebe Barron's Forbidden Planet: A Film Score Guide*, Lanham (MD), Scarecrow Press, 2005.

³⁵ This film can be seen (last retrieved: September 2013) on AT&T Tech Channel (<http://techchannel.att.com/play-video.cfm/2011/12/5/AT&T-Archives-Quartz-Crystal-Growing>).

³⁶ This film is held at the Archivio Nazionale Cinema d'Impresa in Ivrea and available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>), and (last retrieved: September 2013) on Monte Olimpino Studio website (<http://nuke.monteolimpino.it/arte/tabid/518/Default.aspx>).

³⁷ This film can be seen (last retrieved: September 2013) on Monte Olimpino Studio website (<http://nuke.monteolimpino.it/icoloridellaluce/tabid/474/Default.aspx>).

for best industrial film in one of the most important festivals devoted to this documentary genre regularly held in those years of “economic miracle”: namely Mostra Internazionale del Documentario e del Cortometraggio in Venice. Also in light of the visibility these films attained, the cinematic association between new technologies and the use of avant-garde electronic or instrumental music rapidly became a viable option, opening a course which from the early 1960s other composers helped chart. Not long afterwards, electronic music would have made its appearance into *auteur* cinema, where it would have taken on other evocative meanings, starting with *Deserto rosso* (1964, by Michelangelo Antonioni)³⁸. This film shows in the opening credits vocal and instrumental music by Giovanni Fusco together with re-mixed fragments from electronic compositions by Vittorio Gelmetti³⁹.

Among the early electronic applications to industrial cinema one must at least refer to Gino Marinuzzi jr.’s contribution to ENI three-episode feature film *L’Italia non è un paese povero* (1960, by Joris Ivens), although destined to have a limited impact: partially shown at the afore-mentioned Venice festival in 1960⁴⁰, it was then broadcast by the RAI in midsummer at late hours and in a completely re-edited version⁴¹.

Recurring Audiovisual Topoi in the Sixties

With the recurrence of specific image-sound associations during the 1960s, industrial cinema helps reinforce the technology paradigm as a semantic correlate of actual audiovisual *topoi*. On the basis of some examples we shall be able to identify and point out the presence of audiovisual signification units; however, it must be stressed that the very possibility of this identification relies on a hermeneutic process, which cannot avoid taking pragmatic contexts into account. I shall focus on the relationship between the semiotic function of the

³⁸ Maurizio Corbella, *Musica elettroacustica e cinema in Italia negli anni Sessanta*, PhD diss., Università degli Studi di Milano, 2010.

³⁹ Cf. Roberto Calabretto, *Antonioni e la musica*, Venezia, Marsilio, 2012, pp. 137-162.

⁴⁰ Cf. Mario Verdone, *Note. L’Italia non è un paese povero*, «Bianco e Nero», XXI, 7, 1960, pp. 87-90.

⁴¹ On the electronic music scene in Rome and especially on Gino Marinuzzi jr.’s role, see Maurizio Corbella, *Paolo Ketoff e le radici cinematografiche della musica elettronica romana*, «AAA – TAC (Acoustical Arts and Artifacts – Technology, Aesthetics, Communication)», VI, 2009, pp. 65-75. On Ivens’ documentary I may refer to an unpublished text: Alessandro Cecchi and Maurizio Corbella, *Experimentation, Documentation, Censorship: A Joris Ivens’s Industrial Film and the Italian National Broadcasting Television*, paper at the Music and Media 4th Study Group Conference, Torino, Università degli Studi, 29 June 2012.

signification units and their structural basis, within a critical discourse reinterpreting topic theory perspective in order to apply it to the audiovisual context. By doing so, I shall establish an interaction between the different concepts of the film text, interpreting them as different “levels” of audiovisual textuality.

One of most usual associations reinforces the *topos* of impending danger. Like *Ispra 1*, mid-1960s CNRN/CNEN productions also feature many electronic sounds. Many films by Virgilio Tosi and Enrico Franceschelli, involving the collaboration of the composer Franco Potenza, however, show more irregular soundtracks, where electronic sound emphasises only certain shots. Therefore, the communicative strategy focuses on well-defined signification units. Although Potenza employed much less sophisticated equipment than that was available to Berio at the Studio di Fonologia, the audiovisual result is not lacking in communicative effectiveness. In some productions the recurring radioactive danger symbol (the black three-leave clover on a yellow background) is constantly stressed by a rough and almost menacing electronic sound. However, not necessarily disturbing electronic frequencies often emphasise danger expressed by other kinds of signals. This use is entirely conscious and manifest in the audiovisual construction of the first part of *Radiazioni pericolose* (1962, by Virgilio Tosi)⁴², which includes opening credits, completely based on shots of danger signs, and the following sequence (up to 01'15”). Among the many examples, one must single out the synchronisation, at the end of *Atomi puliti* (1965, by Enrico Franceschelli)⁴³, between the shots of storehouses of radioactive waste crammed in barrels marked with the three-leave clover and the electronic sound gradually approaching, until it becomes a lasting “shiver” continuing on the black screen (from 09'58” to 10'12”).

More generic, but nonetheless recurring, the *topos* having its semantic correlate in the laboratory is organised according to a wide choice of possible operations. The shots ascribable to tools and procedures of technologically advanced scientific research – namely precise measurement, detailed report on experiments and laboratory tests ranging from chemical analysis, featuring ampoules and alembics, to exertion or material and structural resistance tests – are unfailingly related to the electronic sound. This happens,

⁴² This film can be seen (last retrieved: September 2013) on ENEA web tv (<http://webtv.sede.enea.it/index.php?page=listafilmcat2&idfilm=273&idcat=30>).

⁴³ This film is held at the Archivio Nazionale Cinema d'Impresa in Ivrea and it is available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>). It can be also seen (last retrieved: September 2013) on ENEA web tv (<http://webtv.sede.enea.it/index.php?page=listafilmcat2&idfilm=47&idcat=30>).

after *Ispra 1*, in many films, from *Il quarto stato della materia* (1963, by Virgilio Tosi, music by Franco Potenza)⁴⁴, showing a series of physical experiments (from 04'05" to 04'27", from 04'58" to 06'18" and from 09'34" to 10'30" and further on), up to *Noi continuiamo...* (1968, by Mario Damigelli, music by Egisto Macchi)⁴⁵. Here the shots of the «analisi chimiche» (from 13'25" to 13'45") and later on those which, indeed introduced by a danger sign, show «controlli strutturali non distruttivi con raggi X o con sorgenti radioattive» (from 13'53" to 14'10"), mark a clear break from the prevailing soundscape in the immediately previous and following sequences, marked by an acoustic, though rarefied and unconventional, sound.

Toward the mid-1960s the audiovisual *topoi* connected to industrial contexts by then form a reserve from which to draw in a conscious way, without excluding the use of more conventional orchestral music. These very different and interchanging soundscapes suggest discontinuity in the modes of representation, contexts and shooting techniques necessarily making up this kind of productions. This is what happens with *FACB. Acciaio su misura* (1966, by Victor De Sanctis)⁴⁶, a film produced by Cinefiat, featuring music by Angelo Francesco Lavagnino. The composer chooses an extensive exploitation of the audiovisual *topoi* stock related to industrial contexts. The simulation of electronic effects attained artfully using orchestra instruments – typical in most 1960s avant-garde music – is encouraged by the cinematic means, where the sound quality is less clear. The long-lasting sound backgrounds of string harmonics, the unconventional percussions (especially the idiophones), the pointillist effects and other characteristics of Lavagnino's orchestration are close and acoustically similar to some compositional uses of the electronic sound: this happens almost exclusively in laboratory scenes. In the sequences of the chemistry laboratory (from 02'40") the sound of the instruments also serves as background for recorded noises, and it carries on as such until the «fase sperimentale» is concluded (05'00"). Soon afterwards the commentary says: «la voce ora è ai forni elettrici». The furnaces have in-

⁴⁴ This film is held at the Archivio Nazionale Cinema d'Impresa in Ivrea and it is available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>). It can be seen (last retrieved: September 2013) also on ENEA web tv (<http://webtv.sede.enea.it/index.php?page=listafilmcat2&idfilm=178&idcat=30>).

⁴⁵ This film is held at the Archivio Nazionale Cinema d'Impresa in Ivrea and it is available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>). I wish to thank Arianna Turci for pointing this out.

⁴⁶ This film is held at the Archivio Nazionale Cinema d'Impresa in Ivrea and it is available (last retrieved: September 2013) on its web tv (<http://www.cinemaimpresa.tv/>). I wish to thank Elena I. Testa for pointing this out.

deed appeared together with the bursting industrial noise, producing a clear break with the previous passage. This kind of succession occurs in different parts of the film. Further on, the composer matches the spectacular casting of melted iron (from 11'52") with musical conventions that go back at least to *Acciaio*: the audiovisual representation of heavy industry and of the most risky and spectacular aspects of working in a foundry has always made use of a relatively homogeneous orchestral timbre, set on large groups of brasses and percussions. In *F4CB* this kind of instrumentation is interchanged with sections characterised by the use of recurring musical themes, present since the opening credits and marked instead by the massive use of strings.

Proving a sophisticated use of audiovisual *topoi*, the afore-mentioned film *Noi continuiamo...* makes an extensive use of orchestral and electronic music by Egisto Macchi, with a particular emphasis on "concrete" sound. In this late 1960s example the voice-over commentary is often replaced by pure audiovisual representation, as it happens with the long sequence (from 18'30" to 21'23") going over the almost whole car assembly line. It consists of a dense video editing, where images are strictly synchronised with a combination of electronic and concrete sound, where the skilful manipulation of the noises of industrial processes prevails. In these parts of the film the rhetorical strategy seems to be based on "tropes" – i.e. on combinations of *topoi* – which may be connected to a transposition in the audiovisual field of old *loci communi*. The rhetorical structures, taken from poetry and eloquence but traditionally applied to music as well, organise the *dispositio* of similar elements; they are formal organisation strategies belonging to different fields. Namely, in the afore-mentioned sequence, the complexity of this audiovisual text, stratified by structural, semiotic and pragmatic levels, stands out with full awareness through the rhetorical deployment. A *locus notationis* is implied; the concept of "montage", indeed, rules all the aspects of audiovisual construction: cars being built along the assembly line (a kind of "montage") are shown through a "montage" editing of images and video sequences, whereas the sound component is nonetheless an example of tape music mostly composed by a "montage" of recorded and synthetic sound. However, it is also a *locus totius et partium*, which we shall nowadays define as the *topos* of structural and semiotic correspondence between the represented object and the mode of its representation. This can be achieved because electronic and concrete music share with pre-digital cinema both the sound recording technology and the cutting and editing (or "montage") procedure of pre-recorded material. Therefore, not only "signified" and "signifier" are completely converging, but the very structures and basic procedures of audiovisual production, con-

sciously highlighted, refer to the same semantic field connected to the *topos* forming the semiotic message. The technology paradigm, common to the represented object and to the modes of audiovisual representation, involves structures, functions and pragmatic contexts, articulating on a rhetorical level the constructive potential of film text dynamics.