



# Functional bodies On Scientific Educational Film During the Cold War

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*Der materiale Ausgangspunkt dieses Beitrags ist eine Sammlung von 16mm-Lehrfilmen aus dem Bestand der ehemaligen Schulbildstelle Weimar, die im Zeitraum zwischen 1950 und 1990 produziert und in den Schulen der DDR genutzt wurden. Der Bestand umfasst insgesamt 258 verschiedene Filmtitel, vor allem aus dem Bereich der Naturwissenschaften, aber auch Filme zu geographischen, historischen, literarischen Themen oder zum Arbeitsschutz; sowie einige Unterhaltungsfilme für Kinder sind darunter. Mit den meisten Kopien ist der Lehrfilm zum Geiger-Müller-Zählrohr (Teil I und II, DDR 1963) in der Sammlung vorhanden. Es ist davon auszugehen, dass diese Filmbilder noch immer Teil des sozialen Gedächtnisses und der kollektiven Identität des östlichen Teils Deutschlands sind. Dieser Beitrag fragt: Inwiefern repräsentieren die Filmcharaktere und -körper politische Modelle?*

*Starting point of this contribution is a collection of 16mm scientific educational films. Originally, the School Educational Image Hire Service of Weimar maintained the collection of now 258 different film titles. Those films were produced and used between 1950 and 1990 in GDR schools. Most of these films in the Weimar collection deal with natural sciences, but there are also films on history, geography, and safety standards in industry or simple entertainment for children. The film with the most copies is the one on the Geiger-Müller counter (in part I and II, GDR 1963). It can be assumed that these film pictures are still part of the social memory and collective identity in the eastern part of Germany. This paper asks: To what extent do the represented film characters and bodies reflect political models?*

## 1. Introduction

Since the nineties most of the Image Hire Services for schools were disbanded all over Germany. Also, most of the schools gave their films away. There is still no general strategy for a systematic collection and conservation of educational films. The film material is mostly fragile and must be preserved and protected in archives. In addition to that the film projectors are often no longer useable. The rights to the GDR Films are in the hands of the German Federal Archive in Berlin.

"Film and television have been the leading journalistic medium worldwide for the past 60 years at least. They shape our knowledge, our identity, our historical conscience, our ideas about neighbors and others like no other medium." (Etamski 2004: 67). That being said, these media are paid too little attention in historical analysis, a neglect justified by the sources' "second-rate status", as they do not depict reality "true-to-life" but rather are purposefully staged and produced. But the special value of films lies

precisely in their accentuation of certain excerpts of reality. Thus according to Etmanski, they are meaningfully evaluable; moreover, "non-fictional films" can be analyzed as "residual sources" as an "impression and excerpt of an erstwhile 'visible reality'" (ibid: 73). Etmanski argues for a stronger focus on films as primary research sources instead of merely seeing them as accessories to printed materials. A similar statement can be made for educational studies (Schäffer/Ehrenspeck-Kolasa 2003: 9).

Instructional films should be seen as repositories of cultural knowledge and practices and thus regarded as a cultural-observational medium. Instructional films were not only a part of the changing but specific audio-visual culture and repositories of intentionally molded bodies of knowledge and practices of mediation. They were also involved in media- and technical-historical processes of change: "Instructional media thus reflect a media-historical development on the horizon of pedagogical and didactic positions" (Crivellari 2010).

In the GDR, instructional films were explicitly appreciated as particularly affect-oriented teaching materials; one hoped that abstract (and particularly ideological) teaching content would be more easily imparted through the film's emotional impact. This estimation was in no way unvaryingly high; instead it was related to processes of change in the political reality and the pedagogical discourses on emotional and rational learning (Kneile-Klenk 2001). It found that in the GDR, more attention was paid to the function of media in order to align its production; meanwhile in the FRG, a more media-critical stance ruled, being more skeptical of the use of media. With historical distance, these analyses themselves become sources that in turn support appraisals of the historical use of teaching materials.

In the English-language literature, there have already been studies on the history of educational films (Oregon 2012, Acland/Wasson 2011). The Oregon study dealt not only with the production and topics of the films but also made the films available as an online resource. Acland/Wasson analyzed the sociopolitical entanglements of so-called functional films. Against the backdrop of the media shift, Alexander (2010) strongly

propounds a production-side-oriented history of the "Academic Films for the Classroom" and thematizes the disappearance of the 16mm film from classrooms and, in its afterlife, the internet. The internet – that is, the digitalized old films found there – functions as a form of transmission. There has also been a systematic analysis for the Netherlands which takes into account the specific forms of composition for the films (Masson 2012). There is a current project at the Georg-Eckert Institute entitled "Educational film in the inter-war era: Germany, France, and Italy in comparison." The project focuses on the history of colonialism and is expanding the educational-historical consideration of teaching material in that respect. Yet natural scientific educational films have not yet been explicitly studied even though their potential for important sociological and intellectual-historical examinations has long been clear (Crivellari 2010).

It is inherently necessary to keep in mind that teaching materials, particularly as intentionally indicative media, cannot be taken as purely neutral documentations of excerpts of reality. Film images have a strong power of suggestion; they are able to evoke both emotions and the semblance of objectivity (Müller 2010). The filmic message is composed in intertextual references between commentary, moving images, and musical underscoring. Even if the verbal transmission of knowledge in the sense of a "disambiguation" (Masson 2006: 18) often plays a major role in instructional films as teaching materials, the filmic elements cannot be neglected. "Like every spoken or written text, the film is also a rhetorical construct. The composition of its form aims to move viewers to adopt attitudes or cooperate." (ibid: 22) Masson uses the term "pedagogical dispositif" to describe the character of educational film as a genre. According to her analysis certain visual and verbal strategies were used to motivate the audience in schools to keep watching (ibid: 25). One can detect formal patterns in instructional films, patterns that can be traced back to certain motivational strategies, such as the appearance of youthful protagonists meant to facilitate self-identification among the young viewers (Masson 2012).

In the educational films on the Geiger-Müller counter different identification figures and role models occurred. Especially in educational films characters – mostly played by unprofessional actors – were used to create an emotional bond with the young viewers. To what extent the body images transmitted by film reflect – beyond the mere conveyance of specialized knowledge – political intentions? This paper will analyze the functions of human bodies in scientific educational films on the Geiger-Müller counter and their emotional charging. The paper tries to answer: To what extent the represented characters and their bodies reflect different political models (Leitbilder) and how bodies are interlaced with the educational film's dramatic structures?

Thus, the focus of this paper is on the film's sequences with characters. This paper consists of three parts: At first I will talk about the characters and their functions in the films on the Geiger-Müller counter. Then I will contextualize these films with a special historical source: the pedagogical reports. In my conclusion, I will try to answer the question: To what extent do the represented characters and bodies reflect political models?

## **2. Rather Function Holders than Individuals**

At first, I will give you a short introduction to the films and its acting characters. The films on the Geiger-Müller counter were produced in the early sixties and used until the eighties. Film one illustrates and explains the components of the counter and their functioning in principle. Film two shows the operating and the usage of the counter. Here you can see a screen shot of part two.



Fig. 1: Film Still "Geiger-Müller-Zählrohr; Teil I: Die physikalischen Grundlagen", GDR 1963.

The first film lasts 9 minutes. In total, in only one minute you can see persons or hands. The setting is changing between a laboratory and a studio with focus on an experimental setup. Also, technical illustrations are integrated. The film's message is: it is important to know the usage of a Geiger-Müller counter for safety reasons in laboratories. In this film the persons are characterized by certain clothing and based on the location – a laboratory – as laboratory assistants: one woman, one man. It is not clear to whom the hands belong; they give only support in the experimental setups.

In the second film, which is a little longer than 7 minutes, humans are acting in about four minutes. Here the practical usage of the Geiger-Müller counter is demonstrated. In some scenes even a group of people is acting. They are characterized as doctors or laboratory assistants by wearing white coats like uniforms. In one scene, a soldier wears a safety combat uniform and a gas mask. You cannot see his face. In the second

film, only one person appears more individual. It is a young woman in dark clothes and with nice hair – she is a beauty.



Fig. 2: Film Still "Geiger-Müller-Zählrohr; Teil II: Inbetriebnahme und Anwendung", GDR 1963.

Unlike other more entertaining films for a young audience, these educational films do not use role models in the same age. These films were projected in physics lessons for an audience at the age of 16. But the characters are young or middle-aged adults – mostly men. They do not look into the camera, they do not speak. There is no direct contact with the audience. The commentary is dominating and the characters only demonstrate the described actions. Most of the time, the actions are displayed in the rhythm of the spoken explanations. In general the persons in these films are rather function holders than individuals. They were used as demonstrators and more or less like display objects.

The presentation of white wearing scientists or doctors in clean technical spaces and the overall impersonal atmosphere work together as a visual dispositive. In combination with the matter-of-fact spoken comment, the

visual idiom suggests a powerful authority and rightfulness. The individual – like the beauty – gets help, but has to subordinate her-/himself.

### **3. The Interlinked Socialist Understanding**

In my opinion, educational films can only be analyzed as historical sources by contextualization. There is an interesting historical source of pedagogical reports, which were written by GRD teachers. In 1954, the GDR Council of Ministers recommended that the best practitioners in the field of teaching should be introduced into educational science. Additionally, the teachers should share their school experiences in an official frame. This call was implemented in 1960. Generally, the reports refer to the official pedagogical frame of Marxism-Leninism. But furthermore, the authors discussed the usage of audiovisual teaching aids as well as teaching units. Later on, the reports were used for vocational training of other teachers. Also, the best reports received awards by the GDR Labor Union Knowledge and Teaching and were collected in the Pedagogical Central Library in Berlin. Especially, science education was a frequent theme of awarded reports. So, it seems like there was a special interest. (Schiller 1994: 446–465)

The reports represent the official understanding of socialist education, which – as Lenin said – based on the principle of science and partiality as well as on the unity of science education and ideological education (Schiller 1994: 452). The lessons in physics particularly interlinked a socialist understanding of science, economy and military defense capability. At first, the lessons were supposed to train skilled workers and soldiers – politically conscious citizens. In the military education, radioactivity and nuclear power were special topics. We are in the era of the Cold War. The reports indicate an explicit ideological point of view. The students were meant to learn that imperialism would always use nuclear power in a hostile and inhuman way. In contrast to that socialism is morally superior and also more powerful, so the safety of the socialist society is always granted. Furthermore, the reports point out that only



socialism will use the nuclear power for the benefit of mankind. Thus, the identification of friends and foes was an important element of lessons in physics. Last but not least, these lessons were used for socialist military education and to instill hatred against the class enemy into the young men. In physics, the theme 'nuclear weapons' was particularly paired with an emotional impact (Klaus 1977; Schulze 1978; Lubach 1971; Wrobel 1982).



Fig. 3: Film Still "Geiger-Müller-Zählrohr; Teil II: Inbetriebnahme und Anwendung", GDR 1963.

One report gives an example for a concrete teaching unit for the tenth class of a polytechnic school. The students were about 16 years old. The simple reading of this example is emotionally shaking. The author reports that the students were quite interested in the topic in general. Therefore, he had to guide the students with a short introduction and the following facts:

- "The first nuclear reactor – the first chain reaction – was triggered at the second December in 1942. The developer was Enrico Fermi. At this time the atomic bomb was an idea.

- The development of the atomic bomb – the controlled chain reaction – was an abuse of science. (There are more examples in history).
- The use of the atomic bomb was not necessary in military terms. Hitler's Germany was defeated; Japan was on the way to surrender.
- The command to drop the atomic bomb was given by US-President Truman, while he debated the peaceful development of Germany with Stalin and Churchill in Potsdam.
- To produce the uranium for two bombs (testing bomb and the Hiroshima bomb) over 24.000 persons worked – 5.800 scientists worked directly to build the bomb.
- The impact of the Hiroshima bomb corresponded to the impact of 20.000 conventional bombs." (Klaus 1977: 15/16)

The students understood immediately, without further explanations – so the author. They were convinced by facts. After this, he demonstrated the principle of the atomic bomb with blackboard sketches. Finally, there was the emotional finish of the unit: He played an audiotape, documentation about the dropping of the atomic bomb and its victims. So, he got the following reaction: "Thoughtful, moved faces – silence, even after the bell signal – a question less, orderly room leaving. Therefore, this kind of unit is particularly suitable to show the imperialistic abomination." (Klaus 1977: 16)

But not only audiotapes were used for this subject. Also, slide shows and educational films like the films on the Geiger-Müller counter were projected. There are as well reports about film education and the usage of educational films. Educational films were defined as practical cinematic pedagogy. The moving pictures should be used as teaching material in schools to provide more visual evidence. In general, the art of socialist films was seen as an elementary part in the formation of a socialistic conception of man and the education of an ideological steady personality. In the reports, the film is characterized as a source of high ideological potential. The reports talk about how the film conveys role models and is effective to create a clear friend-foe mindset. But the main impact of the film is in the emotional field. The film influences the attitude towards the depicted things even in a subtle way. But this reception only works if the film is used systematically. So – again by reference to Lenin – the film is considered to be the first of all arts and the most important one in the socialistic life (Kießling 1989).

But in science education, the educational film was understood as comparable with a textbook part or a chapter of it. Educational films should explain only factual and technical matters. The emotional impact was somehow put aside in this understanding. The interlinkage between facts, models and practical impacts had to be shown in the films. This combination of knowledge and practical purposes was also based on Lenin's concept of socialistic education: "From the visual evidence to abstraction and from this to practice goes the way of truth, the objective reality." (Jung/Vehse 1975: 2)

This concept can be used to describe the composition of educational films like the Geiger-Müller counter: Experimental demonstrations were paired with visual and oral clarifications. Then different possibilities of practical usage were shown; in this case: applications in military, medicine and economy.

#### **4. Subordination Under Political Power, Scientific Knowledge, and Pedagogical Persuasion**

At first, it seems to be a contradiction between the explicit unemotional imagery and the aim for emotional impact in the usage of educational films in schools. Both films present science in a straight-forward, technical, unemotional and convincing way. There is no music. Only a male speaker gives the facts on the Geiger-Müller counter and its usage. The pictures are in rhythm with the spoken descriptions. The relevant information, the school knowledge, is given by spoken words. The settings, laboratory and studio, are unknown rooms for the school audience. They are not introduced as assessable rooms to the viewers. The light in the films is mostly artificial studio light with high contrast. So scientific work stands here in a dramatic and steady spotlight. The mostly static camera settings are also typical for educational films (Gertiser 2006). Those "earnest semantics" (Verdicchio 2010: 49) were used in the films on the Geiger-Müller counter, which Verdicchio described as a visual argument in popular-scientific science films to underline the impression

of objectivity and scientificity (ibid: 91–100). The characters are demonstrators, helpers, test persons like experimental animals, but are not shown as subjects with individual ambitions. They do not speak and there is no eye contact with the camera. All, but one, are professionals in uniforms. The coats mark the knowing people. So, it is a perfect illustration of Pierre Bourdieu's theory of milieus and the effects of clothing norms. The film's emphasis is that you have to trust, not to understand, doctors and scientists.

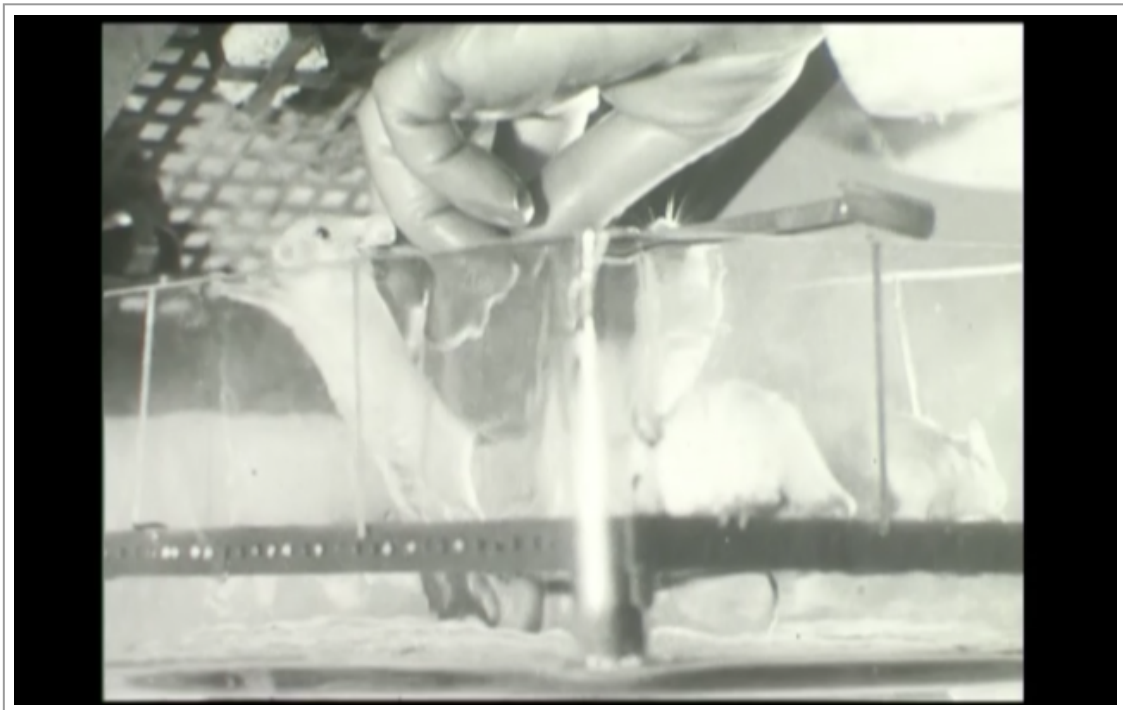


Fig. 4: Film Still "Geiger-Müller-Zählrohr; Teil II: Inbetriebnahme und Anwendung", GDR 1963.

The lessons in physics were supposed to prepare especially boys for their military service, as a report explains. The author emphasized that the girls should simply understand the importance of this knowledge for the boys. So, you can assume, first of all boys were the target group of these films. But – so the same author – the girls ought to influence the boys in the right way. Thus, you can read the beauty as kind of concession in the second film. The beauty represents the stereotype of a nice and kind

woman in the late fifties in the 20<sup>th</sup> century. But she appears timid and even a little scared. It is kind of strange to see the filmed white mouse and then after a cut the beauty. One after another is given an injection, one after another is examined in a wordless and sterile atmosphere.

There is a similarity to the filmic and dramaturgic means of health or traffic education films in this period of time: The didactical usage of emotional experiences – here it is intimidation or even fearfulness – is a usual strategy in those education films. Not the doctors are the figures with whom the viewers can identify. In the educational films on the Geiger-Müller counter the scientists and doctors embody a genuine authority. (Laukötter 2016, Schwarz 2011) So these film pictures do not simply present neutral scientific objectivity. Figuratively speaking, there is black and white like good and bad, true and false. So not only epistemic authority (Masson 2012: 129) is displayed; it is also the power of the political system. In a sense the characters in these films represent in different ways the subordination of the individual to the political power, scientific knowledge and pedagogical persuasion.

During the Cold War era it was not only in the GDR that the demonstration of technical superiority functioned as a source of identity for the domestic and internationally projected national self-image and substantiated the willed national image. Following the Soviet example, the educational system and scientific industry were guarantors of this social identity and were politically and purposefully supported and steered; higher education policy was explicitly part of general educational policy in the GDR (Malycha 2009). Abele speaks of a content-related "technicalization of the higher education system" that took place in the socialist states starting in the 1950s (Abele 2009: 251).

General the status of science in the curriculum was different in the two German States. In brief, the GDR understood polytechnic education as general education. In the socialist ideology science education involved explicitly political, economical and military purposes. The educational films were produced centrally and were coordinated with other teaching aids for all schools in the GDR equal. In the FRG the science education

was more marginally. But after the sputnik shock in 1957 reforms were considered. Generally the curriculum in physics was academic oriented, in a more theoretical and abstract way. The production and the usage of teaching aids were less restrictive and more market-oriented. Most educational films in the western part of Germany were produced by IWF Wissen und Medien gGmbH. This institute was founded by the West German states in 1956. After closing the media stock it was transferred to Technology University Library Hannover in 2012. A part of IWF's analogue film heritage is online.

The GDR educational film on the Geiger-Müller counter dated 1962. The database of the TIB Hannover lists the following FRG films: One Interview with Otto Hahn on Uranium fission (IWF 1956) - the focus is on the speaking old scientist. Also the film "Werner Heisenberg und Carl Friedrich Freiherr von Weizsäcker - Gespräch in München 1966" (IWF 1968) displays two old men in suits who debate atomic physics and cosmology. The other filmic representation is part of a series of films on experiments in physics "Physik in 700 Experimenten" dated in 1974/75. This film sequences present in close-ups the experimental setting and sometimes there are a glimpse of hands, which turn the control dials - applications or other references to the "everyday" life are not addressed.

Well known in the USA were Disney's movie „Our Friend the Atom" (1957) (Heumann/Köhne 2008), which did not only explain the nuclear power in a suitable way for children but also justifies the military usage of nuclear weapons; or the governmental commissioned educational films on the adequate behavior in a nuclear emergency like "Duck and Cover" (1952). Furthermore, the government established educational television channels in the 1950s. For example the film "The Strange Case of the Cosmic Rays" (1957) was produced with marionettes as television special in "The Bell Laboratory Science Series". The Soviet educational films on radioactivity likewise interlinked technical and scientific knowledge with "typical" applications (атомная физика учебный фильм 1970 "Физика, Атом, Ядерная энергия в мирных целях"). In the USA and the SU educational film's scientific knowledge is embedded in political intended

scenarios of usage. Thus, in a wider frame the films of the SU and the USA have in their narratives and visualizations higher similarities to the GDR films than the FRG films. It can be assumed, that the dramaturgical means in the FRG films on the experiments are more related to the educational film genre of the 1920s, with the "static" camera work and the teacher's comment as an integral part of the screening (Gertiser 2006).

## 5. Conclusion

In wider view the films on the Geiger-Müller counter follow the visual tradition of educational films and the related pedagogical media discourse since the early 1920s. It is inherent that the understanding of the films relies on further comments by a teacher and the filmic language is material-related to provide material objectivity (Imai 2013). But also typical elements of propaganda and entertainment films are integrated like filmic and dramaturgic tools as montage and characters at all. It is complicated to prove that things or objectivity are ideological as well – here historical contextualization is required.

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