Germs as Social Protagonists: (In)visible Enemies and the Fear of Epidemic Invasion in Classical Hollywood Cinema

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Abstract
Two of the *biopics* directed by William Dieterle – *The Story of Louis Pasteur* (1936) and *Dr. Ehrlich's Magic Bullets* (1940) – depict fathers of the advent of bacteriology. However, the story of their life journeys is intertwined with major epidemics of the 19th century (rabies, syphilis, diphtheria). Therefore, these two movies face the challenge of giving face to crucial invisible epidemic protagonists such as microbes and germs. This paper aims at exposing how these *biopics* implement visual and narrative strategies to reveal the instrumental role of the microbes and the fear they embody in classical Hollywood storylines. Making the spirochete or other germs actual pandemic protagonists ultimately enhances the type of war rhetoric that characterizes the treatment of viruses as invading enemies to be fought.

INTRODUCTION

During the Covid-19 pandemic, many political leaders characterized the campaign against the virus as a war on an invisible enemy, a fight against clandestine and invasive forces. War metaphors and military rhetoric have proliferated in media descriptions of the pandemic situation (cf. Demoulin 2020), with health workers on the front lines often being portrayed as engaged in a heroic battle against an enemy in the form of a microbe, the unique danger of which hinges on one crucial aspect: its invisibility. Such tropes also figured prominently in 1930s cinematic

depictions of epidemiological diseases and the "microbe hunters"[1] who strove to combat them. But how does cinema, a primarily visual art, represent invisible protagonists? And what might be the political and ideological consequences of a fixation on a metaphorical enemy who is both everywhere and nowhere?

In this context I will focus primarily on *Dr. Ehrlich's Magic Bullet*, a 1940 biographical film directed by William Dieterle, which he made on the heels of *The Story of Louis Pasteur* (1936), another film dealing with a notable scientific researcher. These two films are representative of a broader trend in 1930-1940s Hollywood films: the journey of scientists who contributed to humanity by eradicating epidemics (e.g. Custen 1992). Dieterle, who made a name for himself in the *biopic* genre, encapsulated this trend by drawing particular attention to scientific professions with a strong humanist tone. Indeed, many of Dieterle's movies depict doctors, nurses, biologists – including the founders of the science of bacteriology – as heroic 'germ killers' and narrate the course of 19th century epidemics, such as anthrax and rabies in *The Story of Louis Pasteur*, typhus and cholera in *The White Angel*, and diphtheria, tuberculosis and syphilis in *Dr. Ehrlich's Magic Bullet.*[2]

The challenge is twofold: in addition to representing invisible germs, *Dr. Ehrlich's Magic Bullet* also had to wrestle with the challenge of naming the unnameable, i.e. venereal disease (VD). Germs are crucial actors in all of these stories, and each film evolves a representational strategy to depict not only their reality but their *agency*.[3] Giving bacteria a visible form and allowing them to move on-screen brings with it an interaction between visible and invisible protagonists. But how can the presence of this dreadful invisible agent be evoked? What formal or narrative strategies make them protagonists in spite of their visual absence? And, lastly, what are the potential political and ideological repercussions of such strategies?

To address the double issue of representability of the invisible (visual figuration and censorship constrains), I will first resort to film analysis in order to dissect

1 The expression refers to the title of Paul de Kruif's bestseller of 1926. The novel popularizes the scientific journey of several 19th century fathers of bacteriology.

2 Dieterle's biographical films belong to the "microbe hunter" genre of the 1930s, alongside John Ford's *Arrowsmith* (1931, bubonic plague), *The Prisoner of Shark Island* (1936, yellow fever) and George Seitz's *Yellow Jack* (1938, yellow fever again).

3 The term *agency* is here considered as the capacity of agents or specific groups, thanks to their free will, to interpret their social environment and to concretely act within this context. This is the meaning given by the father of the Birmingham School, such as historian Edward Thompson, from which the *Cultural Studies* emerged and made *agency* one of their key concept.

the audio and visual ways to giving shape to the hidden or unspoken. Borrowing to the tools of *Cultural Studies* in analyzing the production as the reception of representations, I will articulate my film analysis to an examination of the discourses which are formulated in the movies and put them in perspective of their cultural context. Such a method will expose how microorganisms become the protagonists of a story that characterizes them with respect to a certain war lexicon and employs novel formal strategies to give them a visual presence. As their existence got progressively recognized in the 19th century, germs became social agents in society and appeared consequently as social protagonists in the cinematographic storyline and other cultural forms.

THE POLITICAL CHALLENGE OF PORTRAYING GERMS

What do germs and cinema have in common? Both have been sources of the collective fear of invisible contamination. "Germ panic", to use a phrase of the historian Nancy Tomes (1998, back cover; see also Nancy Tomes 2000), can arise as a result of the perceived inability to control the circulation of deadly microbes that spread in society in unperceived ways. As for film, cinephobic discourses of the early 20th century portrayed cinema as a space of 'contamination' of minds and morals where images deliver subconscious ideas that influence the audience and shape their behaviours. It led to a wide range of essays written in the 1920s associating cinema with anxieties, disorders or even pathologies (cf. Casetti 2018). Here comes the analogical phobia of cinema itself as an uncontrolled way to display a specific subject with respect to language and content.

At the time of the making of *Dr. Ehrlich's Magic Bullet* at the end of the 1930s, the representation of venereal disease onscreen was a vexed proposition. Under section II.7 of the so-called Hays Code, which began to be rigidly enforced in 1934, depictions of sexual disease in film were completely prohibited. The contemporary discourse around the film was thus characterized by evasions and circumlocutions. In a pre-release interview for *Film Survey*, for example, director William Dieterle referred to syphilis as the "*shshsh* disease" (Commons 1939, 7), while in his 1965 autobiography, Jack Warner remembers having produced a film about a "closet disease" (Warner 1965, 259). In this context, how does one make a film about a disease that cannot be named but that must, at the same time, educate the public about the dangers of contracting and spreading it? I posit that the way silence is used, as part of the mise-en-scène, becomes one of the fundamental features of this strategy.

The opening sequence of *Dr. Ehrlich's Magic Bullet* immediately evokes some of these dichotomies: what is spoken versus what must be left unspoken, what can be shown versus what must remain hidden. The film starts by introducing the main character – Doctor Paul Ehrlich, played by Edward G. Robinson – in consultation with a patient at the hospital where he works (cf. Dieterle 1940 [01:26-05:05 min.]). The consultation follows a seemingly routine protocol: Ehrlich checks the patient's sight, interprets his symptoms, and prescribes medication to treat his skin lesions. At the same time, we observe a discrepancy between the doctor's nonspecific comments ("a disease like many others", he calls it, "transmitted by inanimate objects" and for which there is a cure) and his injunction forbidding the patient to marry, followed by the suicide of the young patient. The disease in question is never explicitly named, nor is it explained how it is contracted and transmitted. In short, everything is left unsaid; the audience only knows that the young patient is now forbidden to marry.

This scene represents a typical example of how the audience can create a discourse out of specific tropes, symbols, images, and is able to act on changing its meaning. Theories on encoding/decoding strategies are indeed fundamental to understand that the processes of producing and receiving messages are not identical (e.g. Stuart Hall 1980). In this scene audiences in 1940 would have created sense out of the reference to syphilis based on the symptoms described and the prohibition against marriage, although the name of the disease is never mentioned. This ban on marriage echoes the narrative models of films in the previous decade, when syphilis and social responsibility shaped the intrigue around the consequences on marriage for people with the disease. The latter ban is based on the 'premarital examination laws' that were being drafted throughout the United States in the 1930s, which gave doctors the power to prevent a couple from marrying if one of them had contracted syphilis (cf. Shafer 1954, 488). Of course, this legislation is an anachronism in relation to the historical Ehrlich's life (he died in 1915), but such a conflation allows the film to overcome the obligation of silence by constructing a typical situation that implied the disease in question.

In other words, the film tries to subvert a silence imposed by society on pandemic VD protagonists that the contemporary scientific public authorities condemned more generally. Contemporary scientific authorities made indeed common cause with the film in condemning such enforced ignorance. Roosevelt's surgeon general, Thomas Parran, who was employed as a scientific consultant on the film, decried the "conspiracy of silence" (N.N. 1936, 23) – a phrase often reused since (cf. Brandt 1988, 378; Walters/Masel Walters 1991) – and supported popular initiatives in the arts and media to break the taboos and improve the level of public education. He believed that *Dr. Ehrlich's Magic Bullet*, by confronting the

audience with images and representations of the germ responsible for syphilis, was an important part of this awareness campaign. But this controversial situation paved the way to diverse figurative and narrative patterns suggesting a form of imposed silence. The 1938 play *Spirochete*, by Edward Arnold Sundgaard, that Parran also supported, subverts in its morbid poster an artistic view of this 'conspiracy of silence'. A woman, whose profile is divided in two – the left-hand side with regular features while the right-hand exposes her skeleton – is looking at us with her finger in front of her mouth asking for silence. This example shows a figurative tradition of gestures associated with the motives of silence and which echo forms of conspiracy. As I have just described in a more implicit way with the opening scene of *Dr. Ehrlich's Magic Bullet*, we can find in the film many variations on these subversive motives, as also in the trailer, which points out the irony of imposed silence. One aspect of a syphilis narrative is the silent progression of its VD germs, both linked to their unspeaking quality, but also because of a social injunction against their expression. Silence and invisibility are two key aspects in portraying a germ invasion.

MAKING THE INVISIBLE ENEMY VISIBLE

In its capacity to render visible what is invisible, i.e. microscopic microbes, cinema, employing the technologies of science, is uniquely qualified to represent epidemiological protagonists. The microscope allows the camera to disclose things hidden to the naked eye, such as wriggling masses of spirochetes, giving them a visual as well as narrative identity. Through images, and with the alliance of science, the fear of contagion takes shape, can be visualized through different apparatus: various images or avatars indeed contribute to represent microbes, be it the spirochete, the germ of syphilis or the recent avatar of Covid-19. By doing so, cinema portrays pandemic protagonists. But how to endow bacteria with a cinematographic presence? Both *Dr. Ehrlich's Magic Bullet* and *The Story of Louis Pasteur* employ metonymic figures to stand in for the germs themselves. In *The Story of Louis Pasteur*, the seemingly empty bottle the scientist is holding embodies its microbial abundance.[4] This container is valuable for its microbiota reality. As long as they live in the tube in which they are trapped, the bacteria present no danger. Yet, he must handle them with care, otherwise the invisible marauders can quickly prove fatal. This is precisely the warning addressed to Ehrlich in the first

4 Pasteur's poses in the film reference have been borrowed from Albert Edelfelt's 1885 painting of the scientist in the Musée d'Orsay, Paris.

half of the movie. In an early scene in *Dr. Ehrlich's Magic Bullet*, as fellow microbiologist Robert Koch hands Ehrlich a container of tuberculosis bacteria, he warns him of the dangerous nature of its contents (cf. Dieterle 1940 [17:04-19:45 min.]). His forewords underline the metonymy conveyed by the dispenser: what is inside is as aggressive as it is invisible. And indeed, after a few experiments using this sample, Ehrlich starts coughing violently as if he has contracted the disease. The invisible danger has been spread through the vehicle of Robert Koch's container.

Dr. Ehrlich's Magic Bullet employs diverse visual figurations of disease-causing agents. In one scene, as Robert Koch is describing his discovery of the bacillus to his peers in a classroom setting, we see a rendering of a bacterium drawn on a blackboard in the background. The sketch allows the hitherto invisible enemy to take shape, representing the seemingly unrepresentable. The expansion of microbes can also be quantified, or modelled, through different sketching: another scene makes use of a similarly audience-oriented mise-en-scène to this purpose. Ehrlich draws a curve on the ground in order to illustrate to his assembled colleagues how microorganisms reproduce themselves. By representing invisible microbes in images, the film deploys formal strategies akin to those elaborated in the educational films of the previous decade, using graphs, sketches, teaching settings, etc., to give the germs form and transform into visible protagonists of some sort (cf. Ostherr 2005).

In another sequence in the film, Ehrlich presents his theories by sketching images of bacteria on a tablecloth while dining with prestigious guests at Baroness Speyer's house (cf. Dieterle 1940 [01:14:40-01:15:15 min.]). Historically, drawings often accompanied theoretical discussion in scientific publications. Indeed, the historical Paul Ehrlich himself used plates resembling the diagram shown in the film at his famous conference in London in 1900 where he introduced his side-chain theory, a precursor of modern immunology (cf. Ehrlich 1900). The sequence in the film, showing bacteria multiplying on the tablecloth via a time-lapse effect, is in fact an accurate representation of the antigen-antibody chain reaction.[5] That the scene takes place in the midst of a crowded, elegant dining setting almost seems to suggest that the germs too are invited guests, underscoring their easy communicability in the midst of even the most refined of settings. And yet by showing Ehrlich's hand sketching their multiplication, the sequence also emphasizes how microbial spread is still subject to human control. He both conjures the

5 Filmmakers in Hollywood productions paid careful attention to scientific accuracy in such sequences of scientific biographies and often recruited scientific experts for assistance during filming (cf. Kirby 2010).

enemy into being and contains it. In other words, microbes are never left alone in a Hollywood storyline, they are objectified, and therefore subjected to the human eye and control.

Dr. Ehrlich's Magic Bullet also showcases the then-novel technique of micro-cinematography in order to show Ehrlich working on his theory of staining germs (for which he earned a Nobel Prize). This method made invisible microorganisms visible by isolating them using individually targeted colour staining. Though colour could not be visually conveyed in a black-and-white film, of course, by showing the technique, the film gives bacteria another attribute: it turns them into moving entities. What cinematographic fiction brings to the construction of pandemic protagonists is the possibility of a movement. Not only do we see what these organisms look like, we can also observe their behaviour on the screen.[6] "Microbes Caught in Action" (N.N. 1909, 3), as one *New York Times* headline from 1909 put it, referring to French scientist Jean Comandon's 'moving pictures' of microorganisms.

GERMS AS SOCIAL PROTAGONISTS

Rendered visible, germs become social agents. In these Hollywood *biopics*, the exposure of germs turns microbes into disturbing actors. The visualization techniques I previously demonstrated contribute to the process of identifying a social presence, especially through their movement. By their behaviour, they become protagonists in their own right, active agents of our environment. Commenting on Ehrlich's technique of staining bacteria in his book *The Pasteurization of France*, the sociologist and anthropologist Bruno Latour (1988) describes how isolating and identifying the germs turns them into social protagonists:

> Isolated from all the others, microbes grow enthusiastically in these media,[7] which none of their ancestors ever knew. They grow so quickly that they *become visible* to the eye of an agent who has them trapped there. […] This event completely modifies both the agent, which has become a microbe, and the position of the skillful strategist who has captured it in the gelatine [italics in orig.]. (Latour 1988, 82)

6 For a focus on micro-cinematography and the movement of bacteria, see Delahaye 2020.

7 "Media" has been used to translate the original word "milieu" in the French edition. Latour refers more specifically to the "gelatine milieu".

Latour also argues that Pasteur turned germs into social agents via what he calls the 'theater of proof' (cf. Latour 2001, 140): even though they are invisible, germs must still be socially acknowledged, which is why such experiments were carried out in public. In Latour's analysis, germs occupy conflictual roles: on the one hand, they are 'isolated', 'trapped'; on the other, they are invisible and thus could be anywhere. This duality is particularly suited to classical Hollywood cinema, given that such neat oppositions lend themselves to the trope of heroes confronting villains, even invisible ones.

Microbes become dramatic protagonists when placed in the context of combat with scientist-heroes. In the words of Doctor Gustav Sondelius in John Ford's *Arrowsmith* (1931), the "doctors of an older time" have been replaced by these new "heroes of health" [21:06 min.], waging war on bacteria with all the tools of modern science. Two entities are now opposed: 'germ-killers' doctors and their 'germs-enemy'. These roles recall the archetypes of Vladimir Propp's narratology (1928): Pasteur and Ehrlich are the *acting* and *resisting* protagonists, devoting their lives to the service of a noble cause; the microbes are the *opposing* ones. In deploying such vivid archetypes, these films drew on the popularity of *Microbe Hunters*, Paul de Kruif's 1926 best-selling account of heroic medical breakthroughs. The two *biopics* on Pasteur and Ehrlich follow the vivid tone of Paul de Kruif's novel, the rhythm of actions, as well as the depiction of an overwhelming historical epidemiological context. This contrast between protagonists and contextual background, both playing a key role, has been commented by Bertolt Brecht in his in-depth analysis of Dieterle's *biopics*. In *Wilhelm Dieterles Galerie grosser buergerlicher Figuren* [*A Gallery of Grand-Bourgeois Figures*] (c. 1944), Brecht writes:[8]

> The element of conflict in these bourgeois biographies derives from the opposition in which the hero stands vis-à-vis the dominant opinion, i.e., vis-à-vis the dominant class. This is Ibsen's type of the enemy of the people. Society views the mere growth in productive forces as a cancer. […] Pasteur is portrayed as a Galileo of medicine, he too risks jail. […] Dieterle's film biographies, progressive and humanist and intelligent – which alone marks them as a kind of rebellion within the commercial movie industry in America – were also ground-breaking in a dramaturgical sense. […] In Dieterle's films the historical background moved into the foreground and introduced itself as the protagonist. […] Now it became among other

8 Brecht was close friends with the Dieterles, who helped him to emigrate to the United States in 1941 and settle in California.

> things a matter of dramatizing the microbes. The hero was a hero in the struggle against them, just as he was a hero in the struggle against people. (Brecht 2015, 19)

Three elements of this critique are significant for our analysis. First, for Brecht, Dieterle's doctors embody a solitary scientific voice confronting the ignorance of the Establishment. The Marxist subtext is clear: the hero denounces the interests of the ruling powers and rails against "dominant opinion" (ibid.). Dieterle's Pasteur is reminiscent of the Galileo of Brecht's *The Life of Galileo*, a contrarian struggling doggedly against the obscurantist authorities of his time.

Second, Brecht emphasizes the importance of historical context: "the historical background moved into the foreground and introduced itself as the protagonist" (ibid.). Epidemics are not just part of the environmental backdrop; they are key players acting on history, transforming nations and entire civilizations. For historian Frank Snowden, pandemics are the historical acting forces that can be assumed to reverse the power between men and epidemics (cf. Snowden 2019, 2).

Dieterle's biographies make the environmental context a central actor via the representation of newspaper headlines and press releases. In order to punctuate the historical chronology with the life story of the main scientist, close shots of headlines relaying epidemiological developments regularly stop the flow of action in order to put the scientist's deeds in a wider social perspective.

Lastly, Brecht speaks of the films' "dramatizating [of] the microbes" (Brecht 2015, 19). The effects microbes can have are numerous and range from killing a flock of sheep (in Pasteur's experiments) to decimating whole populations. Because the adversary is invisible, its actions can only be seen through their effects on the body of the persons or animals that have been infected. In *The Story of Louis Pasteur*, the moment when young Joseph Meister writhes in pain represents bacteria in action. Back inside the semi-darkness of the laboratory, the camera shows a close-up of the vaccine bubbling away, in a tumultuous fight against infection, giving it a whistle that suggests the noise the enemy is making [57:50-58:47 min.]. The dramatic representation of germs in this manner suggests they can be overcome and hunted down. Laboratories become the new battlefields through visual parallels linking the scientific imaginary with bellicose associations.

THE MAKING OF EPIDEMIOLOGICAL ENEMIES

In equating harmful bacteria with an invisible enemy through visual associations, these films, whether implicitly or explicitly, often deploy the rhetoric of wartime.

This in turn leads to contextualizing the wartime rhetoric associated with science and diseases. Referring to germs as threatening invaders began in popular culture in the late 19th century in such works as H. G. Wells's *The Stolen Bacillus* and Thomas Mullett Ellis's *Zalma*, and scientists, like the forefather of bacteriology, also began to use military terminology when describing their own professional activities. According to James Stark and Catherine Stones (2019), "[s]uch representations of germs – as hostile invaders – arguably owed more to the investigative strategy of Robert Koch and other so-called 'microbe hunters' active around the turn of the twentieth century" (307). Scott Montgomery (cf. 1996, 170-187) associates the research of Pasteur with the origins of 'bio-militarism' and notes increasing use of the language of war by scientists. Both films and science then, have long made metaphoric use of a military vocabulary when speaking about contagion and disease.

Hollywood continued along this line of comparison, adopting the metaphoric repertory of the science-war association. In its very title, *Dr. Ehrlich's Magic Bullet* clearly establishes the metaphoric association of microbiology with a kind of violence. By using the word 'bullet', he associated a doctor's immunological research with a firearm, aiming it at germs to destroy them. In the film, while Ehrlich was experimenting a treatment for diphtheria, he described his search for the "magic bullet" as the attempt to "eradicate and destroy the infectious microorganisms," which "is the promise of modern medicine" [52:19-52:22 min.].

In the press, this warlike rhetoric was linked to the visual evidence of contagion through the use of scientific images. In a contemporaneous article in *Life* magazine about the film, for example, the accompanying caption reads, "Imperceptible but mortal enemies of mankind are the germs of syphilis, diphtheria and tuberculosis […], which Dr. Paul Ehrlich helped vanquish" (N.N. 1940).

This recurrence is typical of the visual and narrative forms of the interwar years. Priscilla Wald (2008) has analyzed the association between disease and war in media in her essay on the outbreak narrative. In the case of typhoid, she points to a 1913 article in *National Geographic* magazine that presents the disease as a "military disaster – literally, a threat to the security of the nation. The title […], 'Our Army Versus a Bacillus,' drives home the point, which surfaces throughout typhoid literature, that hygiene is a military issue" (Wald 2008, 82). In classical Hollywood cinema, the fight against the invisible enemy inevitably takes the form of combat. The doctors and soldiers on the Island of Cuba in the film *Yellow Jack* (1938), for example, explicitly associate the eradication of germs with military operations. Doctor Walter Reed saves the island from yellow fever thanks to the sacrifice of some American soldiers on the army base. These "Conquerors of Yellow Fever", to use the title of the 1939 painting by Dean Cornwell, accomplish

their mission in the manner of a manhunt, going from door-to-door to eradicate the enemy and free the island from its invaders.

In *The Story of Louis Pasteur*, laboratory battles and actual battles blend together: against a background of images of the Franco-Prussian War, we see the face of Pasteur surrounded by a micro-cinematographic shot of teeming microbes along with the caption "While men fought and killed one another, Pasteur was fighting microbes – the real enemy of mankind" [13:22 min.]. The two battles are joined by a double exposure. These biographies prolong the combination of rhetorical styles, sealing in the association between enemies and bacteria both in text and images.

Metaphorical combat in laboratories and military confrontations on the field of battle thus share the same modes of expression. According to Judy Segal (2005), "[t]he metaphor *medicine is war* still informs a great deal of common parlance about medicine. *Invading* microbes are resisted by the body's *defense* mechanisms […]; in the *battle* with cancer, we *bombard foreign* cells, and we *fight* for our lives [italics in orig.]" (123). At the intersection of a visual, popular and scientific culture, the visual construction of germs in this war on microbes is used and reused, partly supported and henceforth fashioned by the mass media.

This enemy-bacteria association produces a kind of reversible, transitive metaphor. Interweaving the terms reinforces both the representation of germs as enemies and its converse: political enemies as diseases to be fought. This linkage is clearly stated in the last scene of *Dr. Ehrlich's Magic Bullet* as Ehrlich musters all his strength for his final speech:

> The magic bullet will kill thousands. But there can be no final victory over the diseases of the body unless the diseases of the soul are also overcome. They feed upon each other. […] In the days to come, there will be epidemics of greed, hate, ignorance. We must fight them in life as we fought syphilis in the laboratory. (Dieterle 1940 [01:39:25-01:41:32 min.])

The film ends with the idea of an association between syphilis germs and fascism, suggesting that the latter spreads much like the former and that the virtues typical of the fight against syphilis – sacrifice, perseverance – can also be found in the fight against the social diseases of political obscurantism and fascist blindness. The "diseases of the soul" (ibid.; i.e. fascism) can be fought in the same way that scientists fight the "diseases of the body" (ibid.). The film makes a connection often found in the visual culture of the period, such as in the poster by Philip

Mendoza that likens Hitler's war to germs infecting a wound.[9] The connection between fascism and disease was further underscored in World War II propaganda posters that linked the fight against venereal disease with that against Hitler or Hirohito (Brandt 1987, 164f.).

The metaphor of the political enemy as biological enemy can be seen in post-war films as well. *Invasion of the Body Snatchers* (1956), for instance, portrays an alarming 'contamination' of a small American community from a mysterious source. A parallel between communist and bacteriological models gradually suggests itself, representing the passage from one zone of conflict to another. In such films, the specific nature of the enemy varies, from fascists to communists, but the use of the disease-war analogy remains the same. The forms of assimilation and exploitation of bacteria as an invisible enemy, exacerbated in times of political upheaval, convey very specific ways of resolving conflicts. The treatment of germs as invisible enemies in these films shows how fears – whether implied, projected, apprehended or exorcized by mass media – are also linked to the linguistic and political contexts of their formulation.

CONCLUSION

Classical Hollywood movies of the 1930s such as *Dr. Ehrlich's Magic Bullet* and *The Story of Louis Pasteur* deal with the difficult task of representing invisible germs at the outset of pandemics or epidemics. Through diverse visual and textual devices, cinema has the ability to give a shape to microorganisms, and consequently, to introduce them within the storyline by developing the action around their thread. As microbes become protagonists in their own rights through both a visual and a textual presence, they are treated as invisible enemies and addressed with a war lexicon. Thus, the battle is led by prophetic figures – such as Ehrlich or Pasteur – whose tasks include unveiling the enemies and targeting them to protect a collective good. The entire infrastructure of the movies embraces the effort of bringing together the spectators to the battlefield by instrumentalizing fear and resolving it through a belligerent lexicon on the one side, and by calling for the defense of mankind and collective good in a dichotomizing depiction of reality and human beings on the other side. Putting these movies in the perspective of their historical context, the belligerent lexicon employed by the mass media in the

9 "A finger-wound being attacked by germs represented by German soldiers in World War II. Colour lithograph after Philip Mendoza", 1940, 680216i, Wellcome Collection Library, [Online], https://wellcomecollection.org/works/cetv9anw, 2023-01-08.

fight against germ contamination created a climate in which audiences became inured to a wartime discourse. The leap from the battle against the invisible germ-enemy to the visible threat of war is short, and a 'war-educated' audience is expected to be an easy target for this second call to arms. By the outset of World War II, the equation of microbes with the 'enemy', a dynamic that had been reinforced by the 1930s films, had become reversed: the most perilous contamination was now political, in the form of fascism and later, communism, rather than a biological threat.

BIBLIOGRAPHY

Corpus Analyzed

Dieterle, William (dir.) (1936) *The Story of Louis Pasteur*, USA, Warner Bros.
Dieterle, William (dir.) (1940) *Dr. Ehrlich's Magic Bullet*, USA, Warner Bros.

Works Cited

Brandt, Allan M. (1987) *No Magic Bullet. A Social History of Venereal Disease in the United States since 1880*, Oxford, Oxford University Press.

Brandt, Allan M. (1988) "The Syphilis Epidemic and Its Relation to AIDS", *Science* 239/4838, 375-380. DOI: 10.1126/science.3276007.

Brecht, Bertolt (1980) [1940]) "Life of Galileo", John Willett/Ralph Manheim (eds.) *Bertolt Brecht: Plays, Poetry and Prose, Volume 5*, London, Methuen.

Brecht, Bertolt (2015 [1944]) "Wilhelm Dieterle's Gallery of Grand-Bourgeois Figures", Marc Silberman (ed.) *Bertolt Brecht on Film and Radio*, London, Bloomsbury Methuen Drama, 19-20.

Casetti, Francesco (2018) "Why Fears Matter. Cinephobia in Early Film Culture", *Screen* 59/2, 145-157. DOI: 10.1093/screen/hjy017.

Commons, David (1939) "A Talk with Dieterle", *Film Survey*, Dec. 1939, 7-8.

Custen, George F. (1992) *Bio/Pics. How Hollywood Constructed Public History*, New Brunswick, NJ, Rutgers University Press.

De Kruif, Paul (1926) *Microbe Hunters*, San Diego, CA, Harcourt Inc.

Delahaye, Lydie (2020) "Micrographia ou le spectacle de la nature", *Les cahiers du musée national d'art moderne* 152, 36-49.

Demoulin, Claire (2020) "Drôle de déclaration de guerre", *Libération*, 2020-03-19, s.p.

Dieterle, William (1936) *The White Angel*, USA, Warner Bros.

Ehrlich, Paul (1900) *On Immunity with Special Reference to Cell Life*, London, The Royal Society of London.

Ellis, Thomas Mullett (1895) *Zalma*, London, Tower Publishing Company Limited.

Ford, John (1931) *Arrowsmith*, USA, United Artists.

Ford, John (1936) *The Prisoner of Shark Island*, USA, Twentieth Century Fox.

Hall, Stuart (1980) "Encoding, Decoding", Stuart Hall/Dorothy Hobson/Andrew Lowe/Paul Willis (eds.) *Culture, Media, Language*, London, Hutchinson, 128-138.

Kirby, David (2010) *Lab Coats in Hollywood. Science, Scientists, and Cinema*, Cambridge, MA, MIT Press.

Latour, Bruno (1988) *The Pasteurization of France*, Cambridge, MA, Harvard University Press.

Latour, Bruno (2001) *Pasteur: Guerre et paix des microbes*, Paris, La Découverte.

Montgomery, Scott (1996) *The Scientific Voice*, New York, NY, The Guilford Press.

N.N. (1909) "Microbes Caught in Action. Moving Pictures of Them a Great Aid in Medical Research", *The New York Times*, 1909-10-31, 3.

N.N. (1936) "Wider Drive Urged on Social Disease. 'Conspiracy of Silence' Scored as Chief Drag on Program to Combat Syphilis", *The New York Times*, 1936-01-16, 23.

N.N. (1940) "Movie of the Week: Magic Bullet. Film Tells Story of Doctor Who Found Cure for Syphilis", *Life*, 1940-03-04, 74-77.

Ostherr, Kirsten (2005) *Cinematic Prophylaxis. Globalization and Contagion in the Discourse of World Health*, Durham, NC, Duke University Press.

Propp, Vladimir (1968 [1928]) *Morphology of the Folktale*, Austin, TX, University of Texas Press.

Segal, Judy Z. (2005) *Health and the Rhetoric of Medicine*, Carbondale, IL, Southern Illinois University Press.

Seitz, George (1938) *Yellow Jack*, USA, MGM.

Shafer, James K. (1954) "Premarital Health Examination. History and Analysis", *Public Health Report*, Centers for Disease Control and Prevention 69/5, 487-493.

Siegel, Don (1956) *Invasion of the Body Snatchers*, USA, Allied Artists/Walter Wanger Productions.

Snowden, Frank (2019) *Epidemics and Society, from the Black Death to the Present*, New Haven, CT, Yale University Press.

Stark, James/Stones, Catherine (2019) "Constructing Representations of Germs in the Twentieth Century", *The Journal of the Social History Society* 16/3, 287-314. DOI: 10.1080/14780038.2019.1585314.

Sundgaard, Edward Arnold (1938) *Spirochete: A History*, Federal Project Theater, Living Newspaper Series, USA.

Tomes, Nancy (1998) *The Gospel of Germs: Men, Women and the Microbe in American Life*, Cambridge, MA, Harvard University Press.

Tomes, Nancy (2000) "The Making of a Germ Panic, Now and Then", *American Journal of Public Health* 90/2, 191-198. DOI: 10.2105/ajph.90.2.191.

Wald, Priscilla (2008) *Contagious: Cultures, Carriers, and the Outbreak Narrative*, Durham, NC, Duke University Press.

Walters, Timothy/Masel Walters, Lynne (1991) "The Conspiracy of Silence. Media Coverage of Syphilis, 1906-1941", *American Journalism* 8/4, 246-265. DOI: 10.1080/08821127.1991.10731384.

Warner, Jack L. (1965) *My First Hundred Years in Hollywood: An Autobiography*, New York, NY, Random House.

Wells, H. G. (1895) *The Stolen Bacillus*, London, Methuen & Co.