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Artificial Aliens: Reproductive Imaginations in German Culture



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# Artificial Aliens:
# Reproductive Imaginations in German Culture

by

Annika Orich

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Committee in charge:
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Professor Anton Kaes
Professor Abigail De Kosnik

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Abstract

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This dissertation, titled "Artificial Aliens: Reproductive Imaginations in German Culture," studies how reproductive processes in biology and the arts evoke similar cultural anxieties, and how they, in turn, are shaped by these same fears. I view and investigate reproduction in biology and the arts as related processes, specifically those conducted via artificial means. My dissertation examines this relationship by tracing artificial aliens as a point of connection across disciplines, media, and periods. The figure of the artificial alien appears as artificial human, othered stranger, alien lifeform, and cinematic image. I develop my argument via several case studies, ranging from Weimar silent films such as Otto Rippert's *Homunculus* (1916/1920) and Henrik Galeen's *Alraune* (1927/1928) to Frank Schätzing's science fiction bestseller *Der Schwarm* (2004) to Netflix's original series *Sense8* (2015-). I argue that there exists a complex dynamic between reproductive processes in biology and the arts and discourses on memory, identity, and media and its archaeology. This project thus contributes to existing research on the interplay between science and fiction. I argue that reproductive imaginations play a crucial role in self-conceptions of the human species. The (im)materiality of the cinematic image is key to rethinking the nature/culture divide. My project therefore highlights circulation and cross-fertilization between the sciences and the humanities.

this dissertation was written for A13

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# Introduction:

# Reproductive Imaginations

In January 2009, an audacious robbery of Germany's most prestigious department store, the renowned Kaufhaus des Westens (KaDeWe) in Berlin, made headlines: three masked thieves outsmarted the KaDeWe's complex surveillance system and escaped unrecognized, stealing jewellery worth several millions of euros.[1] Investigators, at first stunned by the high-profile burglary, eventually celebrated the arrest of two alleged culprits based on traces of DNA (deoxyribonucleic acid) found at the crime scene. However, the DNA evidence—instead of supplying compelling proof of the accused's guilt—turned out to be the crux of the case: the two alleged offenders, belonging to an infamous family of Lebanese immigrants, were not only brothers but identical twins, a familial relationship that was first revealed through their physical resemblance. As a result of their genetic kinship, the incriminating traces of DNA could not be matched to either one of the brothers without a reasonable doubt, making it impossible to establish which one had definitely been at the crime scene.[2] Images of the masked thieves, captured by security cameras, also provided no answers to the exact identity of the robbers and the twins' involvement in the crime, as an expert on biometrics found no convincing congruence between the depicted burglars and either one of the brothers. In the end, both DNA and visual footage, while certainly pointing toward the twins' participation, ultimately failed to prove their identity and guilt, a circumstance that resulted in the release of both men.[3]

Besides being an enthralling account of an extraordinary burglary and an ultimately futile investigation by law enforcement agencies, this brief story addresses several issues that are central to this dissertation on the reproductive imagination in German culture. According to the *Oxford English Dictionary* (OED), "reproduction" gradually came to describe 1) the "action by which living things perpetuate their species (1690)"; 2) the "action of reconstructing or recreating (1754)"; 3) the "action of replacing industrially the assets which have been consumed (1758)"; 4) "natural or artificial means of propagating plants (1762)"; 5) "(in an animal) natural replacement of a lost body part, organ, etc. (1769)"; 6) the "action of republishing (1839)"; and 7) the "copy of a work of art (1839)." The tale of the twin brothers' KaDeWe heist, which could easily be the premise of a Hollywood movie,[4] touches on these different meanings of reproduction in several ways: instances of reproductive processes are 1) the peculiar occurrence of a double reproduction, the existence of identical twins; 2) the implied familial, generational, and ethnic replication of certain traits; 3) the recording of the incident on surveillance video and, hence, the actualization of the thieves; 4) the subsequent duplication and circulation of these images for investigators, expert witnesses, the media, and the general public; and 5) the transformation of this "perfect crime" (Haas) into an intriguing narrative that highlights its artistic and creative—"begged to be filmed"—potential in the German press (Röbel).[5]

The story of the KaDeWe heist points to the fact that reproduction has both biological and cultural connotations. The etymological derivation of the term, in fact, shows that reproduction has almost always embodied both biological and cultural notions and means of (re-)creation. The circumstance that reproduction entails both biological and cultural associations presents a vital cornerstone of the framework of the following analysis. Of interest here are precisely those reproductive instances that have biological as well as cultural implications. The following study is thus centered on the intersections between biology and the arts.

For the purpose of this study, the arts encompass any form of human creative, cultural (re)production, particularly in the form of literary and filmic, written as well as photographic, texts. By examining such texts as case studies, this project takes a closer look at the way biological and cultural reproduction collide, rub against each other, coalesce, and create meaning in their interaction with each other. I therefore view and investigate reproduction in biology and the arts as related processes and concentrate on where and how they interact with each other. At the center of the following discussion is thus the subject of reproductive imagination. Reproductive imagination comprises here the cultural activity of imagining biological and cultural reproduction together. It refers to the fact that this combined imagining is itself an act of reproduction. As a reproductive exercise, imagining reproduction creates meaning about the generative processes it envisions.

To explore the cultural significance and function of the reproductive imagination, the following discussion focuses on how biological and cultural processes of reproduction take part in *Menschenbildung*. The German term alludes to the following, distinct meanings: "Menschen" means "humans" or "human beings";[6] "Bild" denotes a variety of images, such as a paintings, drawings, or photographs; and "Bildung" connotes education, learning, cultivation, literacy, and formation. In the context of the reproductive imagination, I understand *Menschenbildung* as a concept, which denotes three dimensions: it firstly circumscribes the reproduction of humans in scientific as well as fictional laboratories (*MENSCHENBILDUNG*); secondly, it refers to the construction of humans via images and other imagined, cultural codes (*MenschenBILDung*); and, thirdly, it signifies the (re)creation of knowledge about but also via biological and cultural reproductive processes (*MenschenBILDUNG*). As a cultural sphere, *Menschenbildung* thus bundles the diverse components that characterize biological and cultural reproductive processes, that facilitate their mutual execution, and that allow for making visible their precise manifestations.

One specific way in which this notion of *Menschenbildung* manifests itself in the context of the reproductive imagination is in the creation of what I term *artificial aliens*. The idea of *artificial alien(s)* denotes, on the one hand, "Gestalten."[7] The introductory anecdote of the KaDeWe heist captures the notion of *artificial aliens* as Gestalten in the circumstance that the suspected twin brothers—either both or at least one of them—left behind photographic and genetic traces, which rendered the twin brothers concrete and existent without yielding a subsequent reliable identification. The fact that biological and cultural processes of reproduction make the brothers tangible while simultaneously questioning their very identity and existence turns this rather sensational robbery into a phantasmagorical, anxiety-inducing mystery that features seemingly evil twins, alleged criminal migrants, and even clever supervillains as protagonists. As such Gestalten, *artificial aliens* appear in the following discussion as (potential) humans; as artificially (re)produced humans; as alien life-form; othered, migrant strangers; and cinematic images. This assemblage of diverse beings points to a key characteristic all of them share at one point in time. These Gestalten are all alien and aliens, and, according to the OED, "[o]f a foreign nature or character; strange, unfamiliar, [completely] different. Also: [often viewed as] hostile, repugnant" ("alien"). As the mystery of the KaDeWe twin robbers also indicated, being alien, a term used in both biological and cultural contexts, suggests being an outsider, a non-native, and non-citizen; coming from somewhere else, including from extraterrestrial regions; and having divided loyalties. While aliens are often artificial because they may have been created via man-made, technological means, they are always contrived in the sense that their strange Otherness has a constructed, designed quality that deviates from the norm. This project's case studies

demonstrate a cultural penchant to identify and make visible this artificiality, either via technological means or cultural codes.

When viewed as a recurring, reproduced phenomena made up of a multifaceted web of similar characteristics and cultural functions, *artificial aliens*, on the other hand, yield a kind of *Gerippe*, a structural framework, which is made up of alien and artificial Gestalten. As a structural occurrence, *artificial aliens* have been obsessively recurring figures in German culture, which has a rich history of artistic engagement with such beings. For centuries, doppelgangers, automatons, golems, homunculi, machine men and women, as well as mysterious, dangerous strangers have haunted countless fictional worlds imagined by German writers and filmmakers.[8] When examining artificial aliens as a Gerippe that spans across biological and cultural sectors, several eras, and diverse media, it becomes apparent that *artificial aliens* fascinate because they signify forms of reproduction and partake in *Menschenbildung*. *Artificial aliens* and *Menschenbildung* are thus cultural processes that are intrinsically tied together.

These two frameworks are thus ideally suited to the premise of this research as they serve as points of connections across disciplines, media, and periods. In this dissertation, they facilitate the tracing of the cultural relevance of *artificial aliens*, the significance of *Menschenbildung*, and, hence, of the function of the reproductive imagination. By zooming in on *artificial aliens* as a site where such processes and correlations become manifest, this research project argues that reproductive imaginations reveal a complex dynamic between biological and cultural reproduction and discourses on the essence and function of media as well as on national and cultural identity and memory. By tracing the technological and cultural means of the reproduction of exemplary *artificial aliens*, and by examining their nature and cultural functions, the subsequent discussion aims to demonstrate how the reproductive imagination is fuelled by anxieties about and promises of biological and cultural reproductive processes, and how these shared fears and expectations, in turn, shape our understanding of biological and cultural reproduction in the first place. It is the goal of this study, then, to capture the ways in which reproductive imaginations in German culture shape prevalent ideas about what "human" means and, based on biological as well as cultural factors, constructs humanness.

## "Hands off" Human Reproduction

Before introducing the three case studies that serve as a means to delve deeper into the reproductive imagination to carve out its specific anxieties and promises, this discussion begins with the observation of an absence of *artificial aliens* at a time when one may expect an increased cultural engagement with *Menschenbildung*. The period in question, the mid-1990s to the mid-2000s, is characterized by an unsurpassed amount of innovative progress in the fields of genetics and biotechnology—among them, the cloning of Dolly the sheep in 1996, and the mapping of the human genome a few years later. Jackie Stacey's denotation of this period as "decade of the clone" aptly captures not only those ground-breaking scientific developments but also the expectations and anxieties that these key scientific breakthroughs brought about (11). Anglo-Saxon cultures, in particular, responded to these developments via the creation of a myriad of movies and novels featuring bioengineered beings—thus also actively participating in processes of artificial creation.[9] Despite its rich history of *artificial aliens*, German culture, in comparison, seems to have taken a different approach to the "decade of the clone." In her book on the "'homo artificialis,'" Monika

Margarethe Raml pursues the question of why contemporary German authors seemingly hesitate to engage with biogenetic themes and artificial humans in their fictional oeuvres.[10] There are several reasons for this notable reluctance, Raml concludes. "[E]stablished German-speaking writers," she argues for instance, avoid this topic because they perceive it to be an issue that belongs to the genre of "trash literature" only; they believe the motif or theme of the "'homo artificialis'" has run its fictional course, and provides no further productive site of exploration; and they are of the opinion that only science writers should engage with these biotechnological questions in depth (295; cf. 12–21; 294–295).[11] This apparent unwillingness by German-speaking authors is also reflected in the two novels that actually reached a wider audience, *Elementarteilchen* and *blueprint : blaupause*. *Elementarteilchen* found its way into the German book market as a translation of French author Michel Houellebecq's 1998 *Les particules élémentaires*. Charlotte Kerner's 1999 coming-of-age novel, while a "fascinating piece of literature" (Grubert) and a "polemic pamphlet in a discussion that has not even really started" (Simon), is, however, regarded by its publisher and the press as a book for young adults.[12]

In the context of an apparent absence of German cultural fictional narratives about artificially created beings and biotechnology during "the decade of the clone," it is no coincidence, therefore, that the two German films worth mentioning are indeed the cinematic adaptions of the aforementioned two books, Rolf Schübel's *Blueprint* (2002/2003) and Oskar Roehler's *Elementarteilchen* (2005/2006). It is noteworthy that both films—replications themselves—remarkably circumvent a deeper cinematic engagement with the subject matter by foregoing the opportunity to invent their own, distinct filmic language and narrative. Schübel and Roehler are thus representative of a wider cultural trend to avoid an innovative, new engagement with the subject of artificial creation. Another example of this cultural-specific absence is the special program "Künstliche Menschen: Manische Maschinen. Kontrollierte Körper," presented at the 50th Berlin International Film Festival, the Berlinale in 2000: the vast majority of German films featured were produced prior to 1945 ("Retrospektive").[13]

The special program on artificial beings at the Berlinale 2000 indirectly alludes to the key reason why "established writers" and filmmakers appear to be reluctant to tackle the potentials and risks of biotechnological advancements: Germany's National Socialist past presents a historical, cultural caesura.[14] "Here, more than in other countries," Manfred D. Laubichler explains, "the past is a continuous presence that shapes intellectual debates. And the close association of Nazi ideology with the language of biology still hangs like a shadow over any discussion of the implications of modern biology and biotechnology." As Laubichler further concludes,

> [t]his historical focus can pose a problem for an open debate about biotechnology in Germany. Since the language of biology was part of the Nazi ideology, in the name of which the most horrible crimes have been committed, and since the moral imperative derived from German history is "never again," the answer is clear: Hands off from genetic engineering and biotechnology. This is indeed the widespread consensus among German intellectuals and many in the German population.

The credo of "hands off," however, applies apparently not only to the sciences but also to the arts. This cultural peculiarity provides an explanation as to why, as Gabriele Mueller demonstrates, the two movies *Blueprint* and *Elementarteilchen* rather "offer a re-evaluation of the ideological struggles from the recent past [namely, the generation of 1968]" instead of actually targeting questions arising from developments in human engineering and genetics itself (4). In

other words, rather than exploring the present and/or future consequences of cloning for German society and/or humankind—through either being more faithful to the books or established cinematic tropes, or through inventing a new cinematic language, both directors turn to traditionally inner German, historical and generational, topics instead.[15]

As a result of its inhumane, deadly racial and eugenic politics and practices, the country's Nazi past, in summary, influences and, in fact, curtails the German contemporary reproductive imagination. In contrast to other cultures, *Menschenbildung*—even if only contemplated and discussed—faces unique and strict assessment criteria as a result. Two examples shed further light on this cultural idiosyncrasy: German philosopher Peter Sloterdijk's 1999 speech "Regeln für den Menschenpark: Ein Antwortschreiben zu Heideggers Brief über den Humanismus" and German author Sibylle Lewitscharoff's 2014 Dresdner Rede "Von der Machbarkeit. Die wissenschaftliche Bestimmung über Geburt und Tod."[16] Sloterdijk's speech was originally given as part of a symposium on Martin Heidegger and, after it received some criticism, published in the weekly magazine *Die Zeit*. Its publication triggered a nation-wide controversy, in which virtually any notable German intellectual participated.[17] Lewitscharoff gave her speech on March 2, 2014, at the Staatsschauspiel Dresden, which organizes, along with its co-organizer *Sächsische Zeitung*, the Dresdner Reden, a speaker series that, starting in 1992, hosts politicians, academics, writers, and public intellectuals several times a year who address current, often controversial, issues in their talks.[18] Though unrelated, both talks—and, in view of the credo "hands off," it is certainly no coincidence that both Sloterdijk and Lewitscharoff chose the medium of speech to address the subject of *Menschenbildung*—reveal how processes of biological and cultural reproduction and *artificial aliens* cause grounds for anxiety in contemporary Germany because of the specter of Nazi racial ideology and practiced eugenics.

In his talk, Sloterdijk, Germany's most controversial living philosopher, ponders how humans shape humans, as well as humanness.[19] Sloterdijk investigates *Menschenbildung* from different angles, touching on mostly cultural factors but also addressing biological means.[20] His analysis centers on past Humanistic efforts, which were traditionally aimed at civilizing, cultivating, and educating people. According to Sloterdijk, Humanism posits that man's innate savage qualities ought to be—and can be—tamed via didactic writing and reading: "reading the right books calms the inner beast" (15).[21] Consequently, Humanism "is telecommunication in the medium of print to underwrite friendship," a written, medium-specific exchange that Sloterdijk imagines as "chain letter" that partakes in breeding mankind (12).[22]

While Sloterdijk identifies "chain letters" as a traditional means to bolster humans' civilized characteristics, he views mass media, in contrast, as a catalyst for bringing out man's barbaric sides. By aligning mass media (radio, film, and the Internet) with Roman gladiatorial games, Sloterdijk supports Humanism's valorization of the written word, and—by writing an "Antwortschreiben"—he stands in the very tradition he analyzes.[23]

> Above all, however, from now on the question of how a person can become a true or real human being becomes unavoidably a media question, if we understand by media the means of communion and communication by which human beings attain to that which they can and will become. (17)[24]

For Sloterdijk, humanness is thus intrinsically linked to the question of which particular relationship humans have with different forms of media and, by implication, technology. Understood in this way, Sloterdijk's contemplation falls into the sphere of *Menschenbildung*.[25]

Perhaps not surprisingly, the remarkably brief section of Sloterdijk's speech that explicitly addresses the scientific, biotechnological aspect of human engineering drew sharp criticism:

> But whether this process will also eventuate in a genetic reform of the characteristics of the species; whether the present anthropotechnology portends an explicit future determination of traits; whether human beings as a species can transform birth fatalities into optimal births and prenatal selection—these are questions with which the evolutionary horizon, as always vague and risky, begins to glimmer. (24)[26]

People responded particularly negatively to Sloterdijk's call for "a codex of anthropotechnology" for the human zoo (24), which insinuated posing the question of who should, or, worse, ought to be, in charge of making such decisions.[27]

Sloterdijk's speech caused one of the fiercest, and at times most puzzling, debates in recent German history, playing out across feuilleton pages over several months, and throwing light on the extent to which cultural-wide reservations about biological as well as cultural reproductive instances pervade German society. "[I]n general, Sloterdijk's interpretation of philosophy is reviled as dangerous, his motives are branded as suspect, and his call for a human bio-utopia is considered naïve and mistaken," Laubichler says, summarizing reactions to "Regeln für den Menschenpark," which ultimately negotiated issues going far beyond the initial topic of Sloterdijk's talk.[28] "Sloterdijk's arguments themselves are taken to illustrate the horrors of biotechnology that loom just around the corner. Sloterdijk (and by implication all who have hopes that the future of mankind might be improved through biotechnology) is essentially accused of harboring fascist ideas," the theoretical biologist and historian of science further explains in "Frankenstein in the Land of *Dichter* and *Denker*."[29] The Sloterdijk debate, thus, demonstrates how anxieties about the reproduction of biological and cultural properties compound (with) each other—this is evident in Sloterdijk's speech, in the public response, and even in Laubichler's analysis. For example, the philosophical "chain letter" evokes images of DNA strands and double helixes, and its logic is inherently genealogical and hereditary. The consumption of media, by having an impact on personal and cultural natures and virtues, actively partakes in *Menschenbildung*. And the perpetuation of philosophical traditions, ideological schools of thought, and political allegiances becomes a question of national and ethnic identity, potentially shaped by biotechnological interventions.

Additionally, according to Laubichler, the confusion and mélange of scientific and non-scientific terms and expertise presents a problem, as it blurs the "separation of fact from fiction in discussions in Germany about biology and biotechnology." This non-separation is, however, precisely the part of *Menschenbildung* that is of particular interest for this project, and presents a first avenue of analysis. Though Laubichler may have a point in calling for German scientists to be more visible and outspoken in such public debates, I believe that this interplay between "fact" and "fiction" is precisely the place where *Menschenbildung* takes place. In other words, it is neither only the sciences nor only the arts but rather their performative interaction—in an often imbalanced, contradictory combination—that conducts the creation of *artificial aliens*. Though it might be true that "[w]hat most distinguishes the 'two cultures' in Germany is their different

understanding of certain key concepts of science and history" (Laubichler),[30] *Menschenbildung* precisely originates in those moments and sites where biological and cultural concepts of reproduction make contact and, thus, negotiate meaning, even if this occurs via friction. It is therefore noteworthy that Laubichler who criticizes Sloterdijk's speech for its "flair of literary metaphors, … employed in the context of an expected future 'age of biotechnology,'" himself relies on non-scientific language to illustrate his argument, thus posing the question: why, after all, is a scientist who bemoans the blurring of scientific "facts" and humanistic discourses in public discussions ultimately drawn to use Mary Shelley's Victor Frankenstein, the prototype of a (fictional) scientist, to examine the Sloterdijk debate?[31]

This intermixture between biological and cultural—supposedly "factual" and "fictional"—reproductive instances and accompanying anxieties also plays out in Sibylle Lewitscharoff's speech "Von der Machbarkeit. Die wissenschaftliche Bestimmung über Geburt und Tod" and the subsequent fallout, an incident that throws further light on reproductive imagination in contemporary Germany. While Lewitscharoff received generally positive feedback from listeners present at her talk, her remarks on reproductive medicine, which made up the second part of her speech on medical intervention, birth, and death, caused a fierce backlash once her words reached a wider audience. Some of her most controversial remarks include her comments on children born through assisted reproductive technologies (ART):

> I am exaggerating, obviously, exaggerating because today's messing around with reproduction, in my opinion, is so abominable, that I am even willing to view children born via such absolutely repulsive processes as half beings. Not entirely real are they from my perspective but dubious creatures, half human, half artificial I-don't-know-whats.[32]

In her speech, Lewitscharoff thus spoke out against ART, which fill her with "horror."[33] ART treatments, conducted by "Mrs. Doctor and Mr. Doctor Frankenstein," are "abominable" and "absolutely repulsive."[34] She vehemently opposed ART as a viable therapy option to have a child for infertile heterosexual couples, emphasized that her objections are even more appropriate in the case of same-sex relationships, and condemned surrogacy as an "art truly contrived by the devil."[35] Such practices, she argued, were worse than National Socialist "copulation homes."[36] Children born as a result of ART are, as Lewitscharoff explains, "half beings."[37] In the aftermath of the resulting public outcry, Lewitscharoff, who studied Religious Studies, distanced herself from the choice of her words, yet not from the content of her criticism.[38] Besides diminishing the sincerity of her apology, Lewitscharoff's ultimate restatement of her fundamental unease lends further significance to her initial comments.[39]

Lewitscharoff's speech, like the anecdote from the beginning of this introduction as well as the Sloterdijk debate, is thus indicative of the presence of anxieties about biological and cultural reproduction in German culture. In Lewitscharoff's arguments, it is clear how these anxieties also become overlapped with scientific and imaginative concepts. Lewitscharoff's engagement with science does not go beyond the use of a few terms denoting medical procedures, and the way she uses them suggests their "factual" meaning may be as unfamiliar to her as they most likely are to the majority of her original audience.[40] To augment the representation of scientific and medical procedures, and to visualize her objections more explicitly, Lewitscharoff relies—as Laubichler criticizes but also cannot quite escape doing himself—on fictional universes such as *Frankenstein*. In a follow-up interview with *Der Spiegel*, Lewitscharoff reiterated this conceptual train of thought: "The creation of human life via the widely valued reproductive medicine, a sort of

Frankensteinian splicing of biological elements without the involvement of bodies, let alone souls, is grotesque and disturbing, isn't it?" (Schmitter).[41]

Lewitscharoff's "Von der Machbarkeit. Die wissenschaftliche Bestimmung über Geburt und Tod" is instructive in several ways precisely because it presents a seemingly ill-informed tirade. While Lewitscharoff's views—once they reached mainstream media outlets—were overwhelmingly condemned, the incident nonetheless demonstrates how reproductive processes persist to be a contested issue. After all, her initial audience did not perceive her speech as inaccurate, inappropriate, or controversial. The controversy moreover mirrors the Sloterdijk scandal as it is also indicative of a cultural need for continuous debate on the subject matter of *Menschenbildung*, in which established writers pursue other outlets than fictional texts to investigate the issue, scientists continue to play a rather marginal role as interlocutors, and the credo of "hands off" remains to be (re)negotiated.[42] Moreover, Lewitscharoff's statements suggest the cultural significance of—and also fascination with—the practice of mixing "fact" and "fiction" and biology and the arts in the context of reproductive phenomena. By defining what it means to be human at a time in which ART intervention is a common occurrence, Lewitscharoff ultimately constructs *artificial aliens* to argue her worldview. All of these examples, moreover, demonstrate that definitions of real, factual, biological and imaginative, fictional, and cultural reproduction are open to interpretation. German culture's investment with *artificial aliens*, as well as its fascination with and apprehension about *Menschenbildung* thus raise questions about how different and interchangeable humans and *artificial aliens* are, how they create meaning and identity in a cultural climate where the past is always present, and what this particular knowledge actually stands for.

## *Artificial Aliens*: Tracing the Reproductive Imagination

To trace *artificial aliens* and analyze the diverse, complex undercurrents of *Menschenbildung*, the following discussion follows a path of fascination. My approach to examining *artificial aliens* in the context of *Menschenbildung* and to exploring how and why they matter in German culture is essentially rhizomatic. It is therefore certainly not intended to be exhaustive. In *A Thousand Plateaus. Capitalism and Schizophrenia* (1987), Gilles Deleuze and Félix Guattari make a case for understanding and explaining the world in rhizomatic—rather than in arborescent—terms.[43] Rhizomatic thinking takes after and unfolds like a rhizome, which is, "as [a] subterranean stem[,] ... absolutely different from roots and radicals" (6). These thought processes are part of an "acentered, nonhierarchical, nonsignifying system without a General and without an organizing memory or central automaton, defined solely by a circulation of states" (21). While arborescent thought models are made up of branch- and root-like patterns and lineages, "[a] rhizome is made of plateaus" (21). Consequently, rhizomatic approaches circumvent totalizing conceptualizations, account for the existence of variety as well as variables, and address potentialities inherent in developing phenomena. Due to its particular structure, the rhizome is best represented by a map:

> The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group, or social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a meditation (12).

As such a map demonstrates, rhizomatic methodologies, which are "anti-genealogies" (11), have the advantage of possessing "multiple entryways."[44] Following a rhizomatic approach enables this discussion to bring to light relations that go beyond genre- and medium-specific, as well as chronological and spatial, frameworks. This project therefore reflects on the eclectic nature of *artificial aliens* while simultaneously capturing the close connections between biology and the arts. Rhizomatic approaches allow for the exploration of different constellations by putting diverse cultural and biological reproductive instances in dialogue with each other. They moreover facilitate the juxtaposition of various texts, films, and documents and their embedding in further theoretical considerations, while nonetheless leaving room for close readings of these cultural artifacts. This particular approach allows for the examination of *artificial aliens* and *Menschenbildung* from several perspectives, which shift the focus on particular relevant issues in each of the following chapters.

This project first took shape because of my interest in the various test tube babies that emerged out of German silent cinema, *artificial aliens* that ultimately stopped being reproduced.[45] The first chapter traces this early fascination, which was primarily sparked by the curious circumstance that the same language was used to describe humans born via artificial insemination and those created through the reproduction of humans on the cinematic screen. This story of my own captivation with *artificial aliens* and *Menschenbildung* has been expanded here into an investigation of reproductive imaginations in German culture. Tracing *artificial aliens* as an expression of a cultural fascination with biological and cultural reproduction reveals how they serve as a canvas for a variety of scientific and cultural phenomena and developments, and, thus, occupy diverse cultural functions that come together in the project of *Menschenbildung*.

To investigate the reproductive imagination via *artificial aliens* and *Menschenbildung*, the following discussion zooms in on three case studies, ranging from German silent films such as *Homunculus* (1916/1920) and *Alraune* (1927/1928), to Frank Schätzing's 2004 eco-thriller *Der Schwarm*, and the recent Netflix series *Sense8* (2015-). While these cultural artifacts differ in various ways, all of them share a concern for biological and cultural forms of reproduction, feature *artificial aliens*, and participate in *Menschenbildung*. All of the discussed case studies are reproductive imaginations and *Gedankenexperimente*.[46] As thought experiments, these cinematic and literary texts run a narrative, yet scientific experiment: they imagine and, hence, reproduce *artificial aliens* and their cultural functions in diverse scenarios.[47] It is precisely in this moment of reproducing imaginations that knowledge is generated. This mapping of reproductive imaginations then takes as a point of origin the question of how biological and cultural factors come together to construct *artificial aliens* and, by doing so, partake in *Menschenbildung*.

Despite their differences, all of these different types of media are artistic, cultural reproductions, feature *artificial aliens*, and partake in *Menschenbildung*. They are reproductive imaginations by their very nature, engage with biological and cultural processes of reproduction in a narrative, artistic style, and throw light on the issue of reproduction in various, yet connected ways. By being reproductive in nature, and addressing reproductive processes in a media-reflexive manner, these diverse case studies conceptualize reproduction. As such reproductive imaginations, they demonstrate the biological, technological, and cultural complexities that characterize reproductive processes as well as the very idea of reproduction. Part of the complexity of reproductive processes, which these reproductive imaginations reveal, originates in social and cultural anxieties about both biological and cultural reproductive processes. Anxieties exist about the actual act of reproducing, about potential changes to processes of reproduction, and about

different forms of reproduction. These three case studies, understood as cultural sites of reproductive imaginations, then approach issues of reproduction from different angles, for example from a cinematic perspective, a literary angle, and from the view of a digitally distributed television show. Another trajectory that ties these case studies together is that they deal with the reproduction of the individual to those of national and then global collectives.

These reproductive imaginations then demonstrate that reproduction is contingent on historical processes and suggest that reproduction is not only dependent on biological and cultural but also historical circumstances. Although in different ways and via different media and storylines, all of the texts discussed here ask via their engagement with reproductive processes "where are we to find ourselves?"[48], who are we, and how do we connect to each other and our surroundings?

The first case study examines the similarities between test tube babies created via assisted reproductive technologies and the cinema. The chapter "*Assisted Reproductive Technologies* (*ART*): Screening the Test Tube Baby in German Silent Cinema" takes a closer look at two German silent films, Otto Rippert's *Homunculus* and Henrik Galeen's *Alraune*, to demonstrate how cinematic techniques materialize concerns about assisted reproductive technologies, and how, in turn, the filmic ART babies embody anxieties about the reproduction of humans on screen. I discuss how the rise of ART and the cinema during the first decades of the 20th century result in profound anxieties about the nature of film as well as about the meaning of human. By putting the two films in dialogue with theoretical, sociopolitical, and literary texts, and by building on Jackie Stacey's concept of the "genetic imaginary," the discussion outlines a comparable German cultural sphere that makes sense of the rapidly changing fields of biological and cultural reproduction by reasoning by analogy. This comparison of *artificial aliens* allows for delineating how *Menschenbildung* takes place precisely at the intersection of science and art, how it is always biological and cultural, factual and fictional, and natural and artificial. Knowledge about art, being human, and the relationship between these two realms derives from their collective aesthetic and physical characteristics, from their mutually beneficial and productive interplay, as well as from their shared anxieties and promises. Situated in the context of *Menschenbildung*, test tube babies as *artificial aliens*, I argue, demonstrate that their creation on and off the screen goes beyond analogy: they, in fact, come to life.

The test tube babies of the early twentieth century thus present an ideal entryway into tracing the reproductive imagination because they arose in the decade prior to the Third Reich, and, therefore, prior to contemporary taboos about *Menschenbildung*. This era therefore sheds light on concerns about *artificial aliens* and biological and cultural reproduction that exist outside of the cultural credo of "hands off." Moreover, this period presents a historical moment that is quintessentially reproductive: it is, after all, "the age of technological reproducibility" (Benjamin "Work of Art"). This era is not only characterized by an intense cultural occupation with biological and cultural reproductive instances but it, in fact, also presents the first opportunity for ART and the cinema to collaboratively engage in *Menschenbildung*. This circumstance thus allows us to carve out the specific anxieties that film brings to the creation of *artificial aliens*, and, vice versa, to trace the unique impact ART exercises on the cinema. This first converging of scientific and cultural techniques of artificial reproduction ultimately facilitates the quickening of *artificial aliens*, providing one explanation why they hold such sway over the reproductive imagination. The discussion on screening test tube babies, then, shows how the *artificial aliens* of German silent films emerge as the predecessors of later genetically engineered beings, and how they negotiate

certain issues decades prior to the advent of in vitro fertilization (IVF), genetics, and biotechnology.

In view of Germany's rich history of *artificial aliens*, Raml's previously discussed observation that many authors feel no desire to re-examine such protagonists because they no longer appeal as a worthwhile and fruitful subject matter may also explain why filmmakers have opted to largely ignore such beings in more recent years.[49] This hesitation by German authors, filmmakers, and other intellectuals to engage seriously and in-depth with *Menschenbildung* merits, however, further examination. The chapter "Cultures of Circulation: Identity and Memory Politics in Frank Schätzing's *Der Schwarm* (2004)" turns to the best-known and most popular *artificial aliens* that have arguably emerged during a time that is mostly characterized by the absence of such beings. Schätzing's science fiction bestseller tells of humankind's desperate attempt to fight off an attack by the yrr, a swarm-like organism living in the deep ocean. At first glance, the novel, via its apocalyptic narrative interspersed with lengthy scientific passages, portrays and warns against the catastrophic consequences of environmental pollution. I argue, however, that the eco-thriller, through the lens of environmental apocalypse, articulates anxieties about national and ethnic identity and collective and cultural memory. The novel thus makes visible fears about the biological and cultural reproduction of a German *state* at a time when circulatory phenomena appear to threaten it. While *Der Schwarm*'s main antagonists are *artificial aliens*, I demonstrate that the yrr, which embody concerns about bio- and networking technology, are not the alien bodies that present and fuel the main cultural anxieties that the novel addresses. Instead, I show how the novel constructs human *artificial aliens* via the use of stereotypical cultural codes in an attempt to reproduce "bio-Germanness." In other words, *Der Schwarm*, by asking how national collectives perpetuate themselves, participates in *Menschenbildung* via its intervention in discourses on national identity and cultural memory.

The final case study about reproductive imaginations is centered on Netflix's original series *Sense8* (2015-) and the show's creation of the Homo sensorium. These *artificial aliens*, humans who share an emotional and mental connection with each other and are also called sensates, serve as a means to reproduce the sensate experience in Netflix's audience. This chapter is primarily a close reading of the show put in dialogue with Benjamin's thoughts on the reproducibility of the cinematic image and visualizations of the 2015 refugee crisis. While the show is created by American filmmakers—the Wachowskis and J. Michael Straczynski, German director Tom Tykwer was a key collaborator as composer and director, and responsible for the filming of the Berlin scenes, which center on the Russian German safe-cracker Wolfgang Bogdanow (Max Riemelt). The circumstance that the show shot on location in over ten countries, including in Berlin and fifteen other cities; relied on local actors and film crews when shooting abroad; cast non-American actors with heavy accents as main protagonists as well as in supporting roles; is distributed in German from the moment of its release; and has enjoyed "remarkable success" among German audiences (Vivarelli) challenges the notion that the television show is only and purely an American reproduction. These specific aspects of the series' production and distribution thus play a vital role in the show's aspirations to portray a vast spectrum of human existence and, in turn, raises questions about the particular influence such streaming shows have on global viewers and their relation to this medium.

The case studies in this dissertation are comprised of diverse media: films, a novel, and a television show. Reproductive imaginations thus take place across different media that contribute in turn to *Menschenbildung*. By imagining reproductive processes as both biological and cultural

processes and by using their own medium to realize their respective reproductive imaginations, these texts challenge a clear-cut division between what Michel Foucault calls "ars erotica" and "scientia sexualis" in *The History of Sexuality* and, instead, point to the way in which meaning about reproduction is derived from these spheres' messy interaction. "Ars erotica" and "scientia sexualis" are "two great procedures for producing the truth of sex," begins Foucault (57). "In the erotic art, truth is drawn from pleasure itself, understood as a practice and accumulated as experience; pleasure is not considered in relation to itself; it is experienced as pleasure, evaluated in terms of its intensity, its specific quality, its duration, its reverberations in the body and the soul" (57). In constrast, "scientia sexualis," Foucault explains, is based on confessional truth finding. By confessing, knowledge about sexuality emerges, circulates, and reproduces. In some ways, Foucault's distinction between these two distinct concepts of envisioning sexuality and reproductive processes mirrors the common dichotomy between arts and sciences and those spheres' respective roles in reproduction. Yet, as these case studies demonstrate, knowledge about reproductive processes often emerges in the moments when art meets sciences, or vice versa. In other words, intersections—even if unbalanced—matter greatly in the way we imagine reproduction. The particular way reproduction is imagined deserves consideration because, as Foucault demonstrates, sex is less and less about procreation. If human bodies are no longer the sole facilitator of reproductive processes, where else, and how, do reproductive processes manifest themselves? The circumstance that Foucault examined the uncoupling of sex and procreation at the same time the first treatments of in-vitro fertilization took place alludes to the significance of technology and means of artificial creation in processes of modern reproduction. In other words, the following case studies, despite their difference in their media format, demonstrate how reproductive processes have increasingly shifted toward technological sites, which are always about reproduction.

The subject of reproductive imaginations evokes Donna Haraway's 1985 "Cyborg Manifesto." "What would another political myth for socialist-feminism look like?" asks Haraway in her compelling essay. "What kind of politics could embrace partial, contradictory, permanently unclosed constructions of personal and collective selves and still be faithful, effective and ironically social-feminist?" (157). Haraway responds to her own question by arguing that social-feminists ought to think of themselves as cyborgs. "The cyborg is a kind of disassembled and reassembled, postmodern collective and personal self. This is the self feminists must code" (163). Haraway sees the figure of the cyborg as "a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction" (149). The figure of the cyborg, Haraway explains, allows women to imagine an identity for themselves that circumvents the problem of constantly thinking in dualisms and, therefore, reproducing those kinds of dichotomies that have traditionally and predominantly shaped Western explanations and understandings of the world. For Haraway, the cyborg emerges as a creature that embodies a borderless—non-dual—existence: it does not have a traditional origin and is not defined by race, gender, sexuality, or class.

Haraway imagines in her manifesto that the cyborg presents a way out of a biological, social, and cultural system that is based on and constructed according to principles of reproduction. Historically, this structure with its inherently reproductive principles has commonly forced women, who facilitate reproduction in biological, social, and cultural forms, into vulnerable and oppressed positions. By thinking of themselves as cyborgs, Haraway envisions a way out of this structural oppression that results from reproductive processes and women's unique relationship with them. In contrast, "cyborgs have more to do with regeneration and are suspicious of the

reproductive matrix and of most birthing" (Haraway 181). Haraway views post-modern developments as a potential means to perceive the world from a different perspective, as these transformations allow for switching, for instance, reproduction to replication, sex to genetic engineering, and mind to artificial intelligence.[50] The image of the cyborg then embodies these diverse metamorphoses, offering Haraway a path to escape reproductive traditions and structures: "I would rather be a cyborg than a goddess" (181).

On the one hand, Haraway examines how traditional structures of reproductive thinking and organization are also reproduced and enforced by new technological developments. Such advancements copy, participate in, and, even, perfect systems of reproduction. Technology thus remains part of larger processes of reproduction, which continue to be used to enforce restrictions on women. Anxieties about women are thus inherently tied to reproductive processes. On the other hand, Haraway demonstrates how technology erodes and replaces existing structures of reproduction. For example, it questions the boundaries between creator and created, between human and machine, between mind and body. These moments of dismantling and transformation, Haraway argues, provide opportunities for change, action, and innovation. Consequently, Haraway believes that humans—not vice versa—control the extent of technology's influence on their existence.

Haraway's manifesto is of particular interest for this discussion because—by imagining women as essentially cyborgian—she creates her own version of an *artificial alien* to envision a biological, cultural, and social evolution. Consequently, Haraway's figure of the cyborg represents *Menschenbildung*. Her appeal to become a cyborg, like her declaration of being one, carries real implications that go beyond the scope of the written text that reproduces her ideas. "This is a struggle over life and death, but the boundary between science fiction and social reality is an optical illusion" (149). Although Haraway's manifesto makes a compelling case against reproductive processes and structures, her imagining of an *artificial alien* as a different, utopian image of being human is, indeed, itself an act of a science-fiction reproduction, a *Gedankenexperiment*. The "Cyborg Manifesto" partakes in reproductive processes via "cyborg writing," which envisions the tangible figure of a cyborg and calls its readers to imagine themselves as such creatures. Although "cyborg writing," as a creative expression, targets the existing, dominant system, it is not uncoupled from prevalent discourses and can therefore be understood as a reproductive activity in the sense of what Sloterdijk termed the writing of "chain letters." The "Cyborg Manifesto" likewise aims to educate and tame people. As an influential cultural text, Haraway's essay has moreover undergone its own reproductive cycle and been distributed in various ways. It is moreover noteworthy that the "Cyborg Manifesto" ends itself with an ultimate dualism: the choice Haraway poses at the end is, after all, between either becoming a cyborg or being a goddess but not both. This renunciation of existing as a goddess or, indeed, as a cyborg goddess reveals anxieties about biological reproductive processes.

The "Cyborg Manifesto," as a text that constructs *artificial aliens* via reproductive imaginations while also examining those very procedures, thus shows how biological and cultural processes of reproduction are inherently connected. Haraway's text shows how *artificial aliens* serve as a means to ask where we should position ourselves in relation to technology and art; how the response to this positioning determines who we are; and how both of these questions determine how we connect with each other. "The stakes in the border war have been the territories of production, reproduction, and imagination" (Haraway 150). Haraway's text thus provides an explanation as to why *artificial aliens* and *Menschenbildung* play such a significant role in the

reproductive imagination: as long as these structures exist, these cultural sites serve as means to negotiate the meaning of reproduction. It also asks by the very nature of being a text what particular role media—and different media at that—play in biological, cultural, and social reproduction.

In summary, this dissertation studies how biological and cultural reproductive instances evoke, and are in turn shaped by, similar cultural anxieties and idiosyncrasies. By investigating reproduction in biology and the arts as related processes, I trace the theme of the *artificial alien* as a point of connection across disciplines, media, and periods. Over the course of three case studies, I examine the *artificial alien* as both a figure and a framework. The figure of the *artificial alien* appears as (artificial) human, othered stranger, alien lifeform, and cinematic image. With case studies ranging from Otto Rippert's silent film *Homunculus* and Henrik Galeen's *Alraune* to Frank Schätzing's popular eco-thriller *Der Schwarm* and Netflix's *Sense8*, I argue that the figure of the *artificial alien* is the tangible embodiment of a larger, underlying structure pervading German culture: as framework, the *artificial alien* provides a conceptual lens that brings the complex dynamic between reproductive processes in biology and the arts and discourses on memory, identity, as well as media archaeology into focus.

My project addresses a gap in research by spelling out the connection between film as a form of reproduction and the significance of reproduction in film, as well as their representation in other texts and cultural spheres. It likewise contributes to debates on memory and identity by foregrounding the importance of anxieties about reproduction for the development of these discourses. I further demonstrate the relevance of the humanities in shaping scientific achievements, while examining the ways literature and film represent scientific concepts.

**Notes**

1 Cf. Berg; Haas; Röbel; "Polizei fasst."
2 Cf. Haas for a detailed explanation of why the DNA traces were ultimately insufficient in finding both twins or, at least, one of the brothers guilty.
3 Cf. Berg.
4 Cf. Röbel.
5 A note on translations: if not noted otherwise, translations are my own. "perfekte Verbrechen;" "filmreife." While the KaDeWe incident thus shows a variety of instances of both biological and cultural reproductive processes, the story also demonstrates the extent to which current practices of argumentation and identification rely on genetic sciences. In short, the DNA evidence is both the cause for suspicion and the reason for acquittal. It moreover defines the meanings of identity and kinship that are at the bottom of this case. It is precisely the genetic aspects that turn this incident into a spectacular heist rather than a simple robbery, and that lend the case its imaginative, cinematic potential. Moreover, the role played by the video footage in solving the crime—or rather failing to unravel it—points to a close relationship between genetics and film.
6 The singular of "Menschen" is "Mensch" ("human being").
7 The term "Gestalt" connotes here "human being who is not clearly recognizable/identifiable," "character," "figure," "form," and "shape."
8 The influential role past German artworks ultimately played in the shaping of contemporary artificial beings is, for instance, apparent in the unusual circumstance that the English language borrowed the German word "Doppelgänger" during the first half of the 19th century.
9 Cf. the following chapter as well as Stacey.
10 Cf. Monika Margarethe Raml 17 & 22.
11 "etablierte deutschsprachige Literaten;" "Trivialliteratur;" cf. also Chapter Two on such literary classifications in German culture. Raml's conclusions, however, account for and address instances in which authors have published in German feature pages.
12 "faszinierendes Stück Literatur;" "Streitschrift in einer Diskussion, die noch kaum begonnen hat." Kerner's book tells the story of a young woman, Siri Sellin, who was cloned after her critically ill mother Iris in an attempt to

keep her mother's musical talent alive. Kerner narrates Siri's struggle to come to terms with her artificial creation and her overpowering mother to discover her own identity as a person and artist. The book received the German Award for Youth Literature a year after its publication and is part of German school curricula. Kerner also wrote *Geboren 1999*, a novel about a teenager boy who discovers that he was born via a mechanical uterus. One of the main protagonists of Houellebecq's novel is a molecular biologist, who works obsessively on the creation of a human race which reproduces itself via cloning technology. His motivation is partially fuelled by his own fate of not having been able to have a family.

13 "Artifical Humans: Manic Machines. Controlled Bodies." Cf. the book by the same name, published by Aurich et al. It should be noted here that Otto Rippert's *Homunculus* and Henrik Galeen's *Alraune*, which are at the center of the next chapter, were among the featured German films.

14 In her book-length study, Raml does not examine more closely the role of the Third Reich, the Holocaust, and German remembrance culture as crucial reasons for German writers' unwillingness to write about cloning and related technologies.

15 Cf. the discussion on the disaster genre in Chapter Two as well as Dayıoğlu-Yücel 61.

16 "Rules for the Human Zoo: a Response to the Letter on Humanism;" "Dresdner Talk;" "About Feasibility. The Scientific Determination of Birth and Death."

17 The debate is often viewed as a dispute between Peter Sloterdijk and German philosopher Jürgen Habermas and their respective supporters. It brought their—already existing—difference in opinion about philosophical traditions and interpretations to the general public's attention. Cf. Mueller for a very brief overview, within the context of the two movies *Elementarteilchen* and *Blueprint*.

18 "Rede" means "speech." The 2014 program featured Heribert Prantl, Roger Willemsen, and Jürgen Trittin. In previous years, organizers, for example, invited Stephen Greenblatt, Charlotte Knobloch, Jan Philip Reemtsma, Elke Heidenreich, and Julia Franck.

19 Sloterdijk gave this speech originally in 1997. However, it only created a massive public stir when Sloterdijk presented his ideas again on July 17, 1999 at Schloss Elmau (the speech is therefore also known as "Elmauer Rede"). The following discussion refers to the talk's first printed version in *Die Zeit* published in September of the same year. Any translations are from Mary Varney Rorty's translation (2009).

20 While Sloterdijk uses the term "Menschenbildung" to describe the education and taming of people, the term is used here according to the explanation given at the beginning of this chapter.

21 "Richtige Lektüre macht zahm."

22 "ist freundschaftsstiftende Telekommunikation im Medium der Schrift;" "Kettenbrief."

23 "Response."

24 "Vor allem aber ist die Frage, wie der Mensch zu einem wahren oder wirklichen Menschen werden könne, von hier unausweichlich als eine Medienfrage gestellt, wenn wir unter Medien die kommunionalen und kommunikativen Mittel verstehen, durch deren Gebrauch sich die Menschen selbst bilden zu dem, was sie sein können und sein werden."

25 Humans' reliance on media to tame and deter man from fostering their barbaric tendencies leads, Sloterdijk points out, to another set of problems: who is in charge of defining the attributes that tame? Referring to the example of the Humanistic "chain letter" and the building of a social group based on its members' ability to read and write national literature, Sloterdijk argues that the history of taming man is thus also a history of selection. The issue raised by Sloterdijk is therefore also the question of who is in charge of selecting? Sloterdijk derives at the conclusion that what makes human beings human is their distinctive ability (even inevitable necessity) to tame barbaric, innate qualities by themselves, or, importantly, through the help and instructions of other humans and media. In other words, man, Sloterdijk argues, is responsible for himself as he decides for himself if he acts on his barbaric impulses or if he chooses to express his gentler side. This problem receives further urgency because the Humanistic method can nowadays no longer provide the framework for solving these issues. Based on Heidegger, Sloterdijk states that Humanism has failed in its attempt to tame man, as the wars of the twentieth century have demonstrated in particular. The question that then remains is: if Humanism and its "chain letters" have failed, what else works as a taming mechanism?

26 "Ob aber die langfristige Entwicklung auch zu einer genetischen Reform der Gattungseigenschaften führen wird – ob eine künftige Anthropotechnologie bis zu einer expliziten Merkmalsplanung vordringt; ob die Menschheit gattungsweit eine Umstellung vom Geburtenfatalismus zur optionalen Geburt und zur pränatalen Selektion wird vollziehen können – dies sind Fragen, in denen sich, wie auch immer verschwommen und nicht geheuer, der evolutionäre Horizont vor uns zu lichten beginnt."

27 "Codex der Anthropotechniken." Sloterdijk's speech may have also been viewed more critically in 1999 because biotechnological and genetic developments had been further advanced.
28 Cf. Heinz-Ulrich Nennen for an impressively detailed as well as explanatory description of the development of the controversy surrounding Sloterdijk's speech.
29 "Poets and Thinkers."
30 The idea of "two cultures" alludes to British scientist and novelist C.P. Snow's argument that the sciences and the humanities constitute two separate cultures in Western societies. In Snow's view, these distinct spheres rarely intersect, and neither scientists nor people invested in the arts have an adequate understanding of each other's fields and most important concepts and accomplishments. Laubichler pushes this separation even a step further, by arguing that the sciences and humanities in Germany even fail to agree on using and understanding the same language.
31 Since Frankenstein is also often used to describe the monster, the name remains somewhat ambiguous, also implying artificial, fictional creation in this particular context.
32 "Ich übertreibe, das ist klar, übertreibe, weil mir das gegenwärtige Fortpflanzungsgemurkse derart widerwärtig erscheint, dass ich sogar geneigt bin, Kinder, die auf solch abartigen Wegen entstanden sind, als Halbwesen anzusehen. Nicht ganz echt sind sie in meinen Augen, sondern zweifelhafte Geschöpfe, halb Mensch, halb künstliches Weißnichtwas."
33 "Horror." Cf. the following chapter on a further discussion of ART, including its definition for the purpose of this project.
34 "Frau Doktor und Herr Doktor Frankenstein;" "abscheulich;" "absolut widerwärtig."
35 "wahrhaft vom Teufel ersonnene Art."
36 "Kopulationsheime."
37 "Halbwesen."
38 She emphasized, though, that she would not treat children born via ART differently than children conceived naturally. Cf., for example, Kremser.
39 Cf., for instance, Drees; Schmitter. Lewitscharoff's career suggests it is moreover rather improbable that she chose her words unthinkingly. Novels such as *Montgomery* (2003), *Apostoloff* (2009), and *Blumenberg* (2011) won her critical acclaim. In 1998, she received the Ingeborg-Bachmann-Preis for her story *Pong*, and was awarded the Georg-Büchner-Preis in 2013, primarily also for her "sprachliche Erfindungskraft" ("verbal ingenuity;" "Sibylle Lewitscharoff"). Lewitscharoff's efforts to mitigate her thoughts on ART thus seem to be attempts to put her loud critics' minds at ease rather than reflective of having substantially revised her opinion on the matter.
40 E.g. "künstliche Befruchtung" ("artificial insemination" & "in vitro fertilization"; cf. Chapter One); "Leihmutter" ("surrogate"); "Embryo"; "Reagenzgläser und Pipetten und allerlei sonstiges medizinisches Gerät" ("test tubes and pipette and all kinds of other medical equipment") and "Kinderwunsch" ("desire to have children / become pregnant").
41 "Die Erzeugung menschlichen Lebens durch die weithin geschätzte Reproduktionsmedizin, eine Art frankensteinsche Zusammenfügung biologischer Elemente ohne die Beteiligung von Körpern, geschweige denn Seelen, ist das etwa nicht grotesk und verstörend?" Cf. Chapter One for further examples of how the use of ART results, according to some, in the loss of souls.
42 Sloterdijk ponders the potentials of potential (positive) effects of biotechnology on what is essentially Menschenbildung, while Lewitscharoff is totally against it.
43 Part of Deleuze's and Guattari's reasoning is that Western interpretative approaches and systems of representation have traditionally adhered to what both authors label the "arborescent," treelike, model of thought. Arborescent thinking is based on and executed via "tracing" and "reproduction" (12). Such methods and related viewing angles construct the universe according to genealogies, hierarchies, dualisms, and other more static, totalizing systems of organization.
44 In more specific terms, Deleuze's and Guattari's concept of the rhizome is characterized by several features, or so-called "principles." The first two principles they describe are the "Principles of connection and heterogeneity." A rhizome's ability to have countless points of connections, which can be linked to "semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles" (7), causes the system to remain versatile and non-genealogical. The third principle, the notion of "multiplicity," argues against the idea of unity and hierarchy; "[a]n assemblage is precisely this increase in the dimensions of a multiplicity that necessarily changes in nature as it expands its connections. There are not points or positions in a rhizome, such as those found in a structure, tree, or root. There are only lines" (8). The "principle of asignifying rupture" appropriates a rhizome's characteristic to stop growing at one point but start developing into another line at another, either

previously abandoned or new, spot. “There is a rupture in the rhizome whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome. These lines always tie back to one another. That is why one can never posit a dualism or a dichotomy, even in the rudimentary form of good and bad” (9). These traits lead up to the “[p]rinciple of cartography and decalcomania,” which posits the rhizome’s inability to be represented by “any structural or generative model” (12).

45 The motivation to examine those test tube babies more closely was perhaps triggered by my previous research on Bram Stoker’s *Dracula*, which vampiric protagonist serves as a canvas for a myriad of scientific and cultural discourses and shares certain characteristics with the *artificial aliens* discussed here.

46 “thought experiments.”

47 Cf. Horn “Leben ein Schwarm” 104; Macho and Wunschel 12.

48 This question originates in Stacey (259); cf. also Chapter One for its adapted usage in this discussion.

49 German director Dominik Graf is in the process of filming a new version on the legend of the Golem, featuring actor Max Riemelt (cf. Chapter Three).

50 Cf. Haraway 161.

# Chapter One

## *Assisted Reproductive Technologies* (*ART*): Screening the Test Tube Baby in German Silent Cinema

### Introduction

"Please sign here." I imagine that Doris and John Del-Zio, the first couple to attempt in vitro fertilization (IVF) to conceive a child in the early 1970s, were given this instruction when initialing the following waiver outlining the possibility that their future offspring might suffer from birth defects: "We understand that there is the possibility of … the birth of an abnormal infant or infants, or undesirable tendencies or other adverse consequences" (qtd. in Henig 3).[1] While the Del-Zios' dream of conceiving a child never came true,[2] ART—assisted reproductive technologies[3]—fulfilled Lesley and John Gilbert Brown's wish of having a biological child.[4] In July 1978, the birth of their daughter Louise Joy Brown, the first "test tube baby" in the world, was greeted by a worldwide media frenzy. Despite the general enthusiasm, Louise's birth also raised instant concerns about the legitimacy of this technology and its impact on children's essence.[5] One opponent voiced fears about the potentially abnormal nature of Louise by mailing a photograph of her to the first major American IVF clinic[6] in the early 1980s: the sender had written "'She has no soul'" across the grainy picture of Louise (qtd. in Henig 214).

The waiver and the postcard suggest that life created with the help of scientific technology may deviate from life conceived naturally, and that artificially reproduced life may possess aberrant, perverse qualities that may or may not be clearly perceptible. Both these examples, which echo the 2014 remarks on IVF by Lewitscharoff,[7] disclose anxieties surrounding ART and are first attempts at making evident any abnormalities. The image and its graininess render visible Louise's alleged soullessness, a deviancy the waiver implies by mentioning "undesirable tendencies" as a possible birth defect. The use of Louise's photograph to visualize (in)human qualities in babies conceived via IVF indicates a closer affinity between ART and photographic—by implication, film—technology. This special connection began to show the moment Louise was born: the team of medical professionals responsible for Louise's conception and birth made use of the camera to prove that she came into life alive. Filming and screening her birth was primarily meant to document and prove her normalcy as well as genealogy.[8] Hence, I argue that images—especially moving images—literally quicken test tube babies: they call not only these children's artificial origins and potential freakishness but also their existence and humanity into being.

These instances of technological reproduction in biology and the arts, I thus reason in this chapter, are related processes: I demonstrate that they evoke similar cultural anxieties, and are, in turn, shaped by the same fears. To trace these interconnections, I turn to German silent film, namely two of its most prominent pictures featuring artificially created humans: Otto Rippert's *Homunculus*-series from 1916/1920[9] and Henrik Galeen's 1927/1928 silent film *Alraune*.[10] I show that *Homunculus* and *Alraune* are both products of as well as reactions to technological developments made in both the sciences and the arts at the time of their respective creation. Both films rely on analogous motifs and pose similar questions in their exploration of artificially reproduced life and its relationship to the cinema. They share the assumption that artificially created human beings possess aberrant traits and are perceived as different, that they struggle with

the way they came into being and their resulting difference, and that they will ultimately turn against their creators and fellow humans in a violent fashion. Both films rely on similar cinematic techniques to call their artificial humans into existence, and to visualize the cultural anxieties and promises both ART and the cinema evoke.

To summarize, I demonstrate that the films' overlapping narrative components, similar cinematic aesthetic, profound ties to the scientific community, and shared social anxieties lay open a cultural space where biological and reproductive instances, personified by *artificial aliens* such as Homunculus and Alraune, fuse together and become a reality. By not only intersecting but coalescing in this cultural sphere, ART and the cinema, which, in comparison to literature, had emerged as the ideal, most suited medium to animate objects and people artificially, partakes in what has been described as *Menschenbildung* in the previous section. In the following discussion, the three dimensions of *Menschenbildung* denote concretely: firstly, the creation of humans in the laboratory (*MENSCHENBILDUNG*); secondly, on screen (*MenschenBILDung*); and, thirdly, the generation of knowledge about biological and cultural reproductive processes (*MenschenBILDUNG*).[11] By facilitating the blending together of biological and cultural reproduction, film technology becomes its own version of ART, contributing not only to exploring questions about human life but also constituting it.

## German Cinema's Test Tube Babies: Homunculus & Alraune

"I'm not a man like others,"[12] the man-made protagonist of *Homunculus*, known as Richard Ortmann (Olaf Fønss[13]), confesses in the then hugely popular silent film series.[14] Over the span of six episodes, Rippert's series depicts how Ortmann, the Homunculus or "Maschinenmensch," retaliates against humankind out of anger over his scientific, artificial creation and resulting inability to love. "The place of my birth is a chemical laboratory … I owe my life to the idea of a scientist," he goes on. "My parents are the beakers and the mixture of a researcher." This sequence of intertitles—presented as journal entries that are discovered by the film's female lead Margot (Mechthildis Thein) while Ortmann sleeps blissfully unaware nearby—signifies a pivotal moment in the series' fourth installment. Homunculus's written confession, first revealed to the film's audience through Margot's eyes, spells out the exact cause of this difference: Ortmann's creation, along with his inability to experience human emotions other than hate, is due to ART. The unnatural circumstances of Homunculus's birth are then rendered visible via a brief flashback,[15] which shows a group of four men, mostly dressed in white lab attire, hovering over a bundle of white cloth. One of the scientists falls, seemingly deeply moved, onto his knees and holds up a baby-look-a-like-figure. Gleaming with pride and awe, the kneeling man hands the creation to another scientist, who cradles it in his arms. The sequence ends with a shot of the present-day, grown-up, and peacefully sleeping Homunculus.

Still from *Homunculus* birth scene[16]

Almost a decade later, Henrik Galeen's *Alraune*, which portrays the story of successful scientist Professor ten Brinken's (Paul Wegener) experimentation with ART, emulates the way Margot learns of Homunculus's strange origins: the artificially conceived child, Alraune (Brigitte Helm), reads ten Brinken's journal, in which her presumed "father" has meticulously recorded his "daughter's" development over the years,[17] and thus discovers the mysterious circumstances of her conception. As revealed at the beginning of the film, Alraune's biological father was a murderer (Georg John), retrieved from prison by the ambitious scientist, and her mother a prostitute (Mia Pankau), working on the streets.[18] Hence, Alraune is, as ten Brinken, the "world-famous authority on genetic cross-breeding," phrases it, the offspring of "the scum of society." When snooping in her father's journal while he sleeps soundly in the next room, Alraune, for the first time, learns about her tainted bloodline and unusual childhood. As in the case of Rippert's *Homunculus*, Galeen's camera performs a similar animation of abnormality immediately following Alraune's discovery of the role of ART in her existence: her distorted, thus creepy, shadow, skillfully captured in a close-up and with the use of hard lighting, emerges as a visible marker of her artificial Otherness. Her shadowy twin soon develops a life of its own, as it seemingly splits away from its original, more material body. In a subsequent, brief scene, shadowy hands, captured in a close-up, slowly creep along the white bed sheets covering the sleeping ten Brinken, gradually closing in on his neck, in an apparent attempt to strangle him.

Screenshots from *Alraune*[19]

These two crucial scenes from each respective film epitomize the threefold manner in which *Homunculus* and *Alraune* engage with *Menschenbildung*, and the way both films thus shape

the greater sphere of *Menschenbildung*. As the following discussion will demonstrate, *Homunculus* and *Alraune*—through their narrative, aesthetic, and technological engagement with these three dimensions of *Menschenbildung*—ultimately uncover cinema's specific contribution to molding this cultural space: test tube babies, both cinematic and science-based ones, become knowable, identifiable, and real because of film technology.

## In the Lab: ART's Adverse Consequences in the Cinema

The unorthodox creations of Homunculus and Alraune constitute the characterizations and storylines in both films. Together, Rippert and Galeen contributed to establishing now common cinematic tropes, which certainly mirror earlier literary conventions. Cases in point are the portrayal of Homunculus's and Alraune's creators, their mysterious laboratories, and uncanny experiments. In both films, scientific—thus, social and ethical—boundaries are being pushed and, eventually, violated by scientists, all of them men who act out of dubious ambitions. Their ingenuity is tinged with madness, as their scientific meddling interferes with several unwritten laws of nature and religious decrees. Consequently, these men pay a price for their transgressions: one of Homunculus's creators, Dr. Hansen (Albert Paul), when attempting to poison his hate-filled creation, kills his daughter Margarete[20] (Lore Rückert) instead;[21] forces of nature ultimately destroy his artificial creation—a collapsing mountain literally stones Homunculus to death. Ten Brinken eventually harbours incestuous desires for Alraune, which, spurred on by her actions of highly questionable morality, cause his professional, financial, social, and ethical ruin, culminating in his attempt to kill her. In the end, both films' test tube babies turn against the fatherly scientists who brought them into being. *Homunculus*'s and *Alraune*'s scientists thus evoke not only Mary Shelley's Victor Frankenstein but also the many disturbed, magnetic, and brilliant scientists and maniacs commonly featured in German Expressionist silent films, most importantly *Metropolis*'s C.A. Rotwang (Rudolf Klein-Rogge; 1927).[22] While Rotwang is generally regarded as the cinematic archetype of the "mad scientist," now a ubiquitous trope on television and movie screens, these lesser known scientists of *Homunculus* and *Alraune* contributed to the fleshing out of this popular fictional stereotype and advancing its vast prevalence. Their portrayals also demonstrate how the "mad scientist," despite the trope's general, seemingly unvaried longevity, embodies culturally and historically specific anxieties: Hansen's, Ortmann's, and Edgar Rodin's (Friedrich Kühne) fascination with technology, also reflected in their test-tube- and "Maschinen-"look-alike laboratory—cause violence and, even, war, while Galeen's film, with its emphasis on genetic factors in the creation of humans, is rather interested in depicting modernity's societal changes.[23]

The trope of the "mad scientist" is particularly interesting insofar as it shows the power of literary and cinematic fiction: these fictional scientists, many of them dreamed up by German-speaking authors and filmmakers and based on the idea of the evil Nazi scientist, are often not only better known and more familiar to us than real ones but they have also had a greater impact on prevalent cultural ideas about researchers and their work.[24] For Roslynn D. Haynes,

> the prototypical scientist of counter-culture exemplified intellectual hubris. Arrogant, secretive and dangerous, his obsessive focus on his research rendered him contemptuous, even oblivious, of society's norms and relationships. The master narrative of the mad scientist consistently presented him as a dangerous over-reacher, determined to transcend human limitations and precipitating a wave of retributive events. This character was pivotal

> in subverting the 'great men' account of science, enacting instead our nightmares that new, secret knowledge may misfire or be deliberately misused. He was depicted as mad, partly because he was not amenable to reasoned discourse, but also because, from Roman times, genius was linked with insanity as symptomatic of an unbalanced nervous system. ("Whatever Happened to the 'Mad, Bad' Scientist?" 33)

Not surprisingly, the desire to create a human being—via alchemy to cloning—has been the main obsession of these scientists. As Haynes points out, only recently have literature and cinema provided more positive characterizations of scientists: she credits this shift in the portrayal of literary and cinematic scientists to a change in perception of real scientists in the public eye who have increasingly been perceived as positive figures for, among other things, environmental causes, infertility treatment, and mathematical applications ("Whatever Happened to the 'Mad, Bad' Scientist?" 35–42). Moreover,

> [t]here are now alternative 'competitors' for that role [of the stereotypical bad scientist]: insane gunmen, religious fanatics, terrorists, extortionist companies, destroyers of the environment, and passionate, violent adherents of many persuasions from animal rights to right-to-life protesters. Since 2001, we have learned to fear most the terrorism and fanaticism arising from political systems and fundamentalism and, underpinning them, the unpredictable madness of despotic or fanatical leaders. As before, the psychology of the unbalanced, evil mind is the real and abiding source of fear, but this is no longer attributed to scientists. The 'popularity' of the mad scientist as both fictional character and movie star has declined because we no longer need him. The new face of terror is the terrorist. ("Whatever Happened to the 'Mad, Bad' Scientist?" 42).[25]

*Homunculus*'s and *Alraune*'s scientists' madness largely manifest itself in their test tube babies' Otherness. "Adverse consequences," ranging from uncanniness to perversion, attest to the perils of their scientific aspirations and, thus, to the insanity of pursuing such experiments. While the trope of the "mad scientist" typically includes the proud celebration of a breakthrough experiment, this initial delight is always overshadowed by the following revelation that something went horribly wrong in the process. It is indeed the process that is the crucial factor; in the context of creating human life, intervention, viewed as artificial, has profound and dubious effects. Even though Homunculus and Alraune—at first glance—look physically like any human conceived via sexual intercourse, ART has had a bearing on their inner, emotional constitution. Accordingly, Rippert's film series depicts how ART has had the adverse consequence of depriving Homunculus of feelings of love, a form of personality disorder that intensifies his capability to hate. "Indeed, the rather plain conclusion that could be drawn from this film series is," Tanja Nusser concludes, "that second creations are not human and, therefore, they are not governed by human emotions, they have no morals, and are humans' potential enemies, since, as well as although, they are similar to humans. If, however, enemy and stranger are no longer to be differentiated from friend and one's own, then, we are lost" (97).[26] While Nusser here specifically talks about *Homunculus*, her conclusion also holds true for Alraune whose atypical conception serves as a pivotal explanation for her deviancy, which is primarily revealed in her inability and unwillingness to conform to conventional female—that is, biologically natural and, hence, human—gender roles.

Moreover, both films stress the danger of ART as they seemingly decide the nature vs. nurture debate in favour of the former. By carefully engineering Alraune's parentage, ten Brinken

acts on the assumption that Alraune will inherit her parents' delinquency; by having her brought up by nuns, he assumes that this hereditary abnormality could be corrected via nurture. While *Homunculus* pursues the question of the role that nurture might play in its protagonist's violent disposition to a far lesser extent, the film nonetheless acknowledges the potential of environmental factors for character development (e.g. Homunculus's brief comments about the absence of actual parents, his fraught relationship with his creators, and Margarete and Margot loving him). At the core of the Otherness of both test tube babies, therefore, lies their inability to bond with naturally conceived humans, as well as the latter's incapacity to love the ART children unconditionally. Consequently, Rippert's six episodes chronicle a series of rebuffs and failed relationships, and Alraune's licentious relationships with several men, especially, ten Brinken, and her otherwise promiscuous behaviour turn her into a social, hazardous outcast. In both films, abnormal family dynamics and (sexually) inappropriate interpersonal relationships, which provide no lasting emotional connections, become a canvas that makes the inherent deviance of the two test tube babies narratively visible. These key thematic strands in both films ultimately answer the nature vs. nurture debate by pointing to Homunculus's and Alraune's ART origins as the main reason for their abnormal personalities. In other words, ART always involves adverse consequences, a by-product that affects both internal factors (nature) as well as external influences (nurture).

Adverse consequences of the ART process can be read, on the one hand, as symptomatic of larger cultural trends and discourses that were prevalent at the time both films were produced and (re-)released. On the other hand, protagonists' characterizations and storylines also contribute to and therefore shape such cultural anxieties and heated debates. Galeen's *Alraune*, for instance, zooms in on women's struggle for emancipation and the hard-fought transformation of gender roles during the first decades of the 20th century by portraying Alraune—albeit pointedly—as a Weimar New Woman. Having achieved previously unforeseen independence during World War I, many women were reluctant to give up their newly found freedom, which further spurred on the post-war women's movement. New images of femininity emerged, which many perceived as a demoralizing threat to traditional social and cultural norms. Debates about neglected children, a declining population, effete men, and masculinized women erupted. In other words, the women's movement and associated phenomena, such as the New Woman, account for a number of concerns linked to reproduction, the disintegration of the conventional family structure, the survival of the genealogical family line and that of the nation.

A striking case in point is Friedrich M. Huebner's 1929 essay collection *Die Frau von morgen, wie wir sie wünschen*,[27] which features writers such as Max Brod, Robert Musil, Stefan Zweig, and Frank Thiess. In the last contribution of this volume, Thiess, for example, argues that women's push for independence has resulted in a "crisis of the new freedom"[28] (169). He makes a case for setting limits to women's emancipation, particularly in regard to their "erotic freedom" (172); insists that women are ultimately the weaker sex—an innate and biological given (169–182); and wishes for an "amazon-like gender"—unemotional, hard-working women, wives, and mothers who accept their own as well as their gender's limitations, and are courageous and proud, pure and natural (180–181).[29] This final chapter is reflective of the volume's overall stance on the women's movement, as authors acknowledge women's rights but only within the boundaries they deem appropriate. The (ideal of the) Weimar New Woman personified these male anxieties, often caused by feelings of loss of identity and control. As women's rights advocate Elsa Herrmann argues in 1929, a New Woman "refuses to lead the life of a lady and a housewife, preferring to depart from the ordained path and go her own way" (206). Herrmann describes "the woman of today [as being] oriented exclusively toward the present," instead of focusing on the future, an

outlook that characterizes women primarily concerned with taking care of their offspring (207). This rejection of childbearing and domestic duties earned women striving for a life outside these cultural conventions the label "unfeminine" (207), which also translated into being perceived as frivolous and promiscuous. Moreover, "[t]he bloodless bluestocking, the sexually aggressive femme fatale or the overtly vulnerable femme fragile—all personifications of the new woman, were associated with sterility" (Benninghaus 385).[30]

These debates,[31] and particularly the negative stereotypes, associated with women's push for more independence and insistent challenge to gender norms proved to be a productive inspiration to Weimar cinema's filmmakers and, especially, their portrayals of female, artificially-made protagonists. Galeen's Alraune, like the Maschinenfrau (Brigitte Helm) in Fritz Lang's *Metropolis* (1925–1926/1927), owes much of her uncanniness to the New Woman and surrounding cultural anxieties. Indeed, both films depict their artificially created protagonists in rather similar terms, primarily in their most climactic, titillating scenes.[32] In those instances,[33] the Maschinenfrau and Alraune wear outfits representative of the New Woman, such as the Eton crop hairstyle, fitted headpieces, and clothing revealing their natural feminine contours. Physical movement, such as dancing,[34] emphasizes and amplifies female, rather voluptuous, physicality, which enchains the gaze of the male spectators.[35] This display of the female body is depicted as essentially causing mental and, hence, physical distress and illness among the male audience.[36] Alraune openly shows the contrast between traditional expectations of women and new possibilities emerging in the Weimar Republic. "[T]he test-tube baby who becomes a New Woman," Valerie Weinstein concludes in her often-cited analysis of Galeen's film, "is not merely degenerate but monstrous" (208).[37] As Anjeana Hans then shows, Alraune's "dangerous hybridity" originates in her portrayal not only as the feminine object of the male gaze but specifically in her propensity to turn her gaze (back) on her male admirers and, thus, the audience. Alraune's unsettling, even hazardous gaze is reminiscent of the depiction of the eyes of Olimpia, the automaton in E.T.A. Hoffmann's 1816 Gothic novel *Der Sandmann*, and of her human counterpart, Clara.[38] Moreover, a significant part of the cultural anxieties about the New Woman is her desire, as well as ability, to become (more) independent, mobile, and free—Olimpia, on the other hand, largely derives her uncanniness from her wooden immobility, a social critique of conventional understandings of women's role at the time. The independence the emancipated (New) woman pursued comprised decisions about her body and, hence, physical mobility.[39] Alraune, thus, does not stand still: she runs away from the convent she grew up in, travels on the train, joins a circus, and, ultimately, leaves behind her "father." Cinema's obsession with movement and mobility provides, on the one hand, an explanation for film directors' fascination with the phenomenon of the New Woman; on the other hand, it also explains film's unique ability[40] to magnify these particular cultural anxieties. To add to Weinstein's, Hans's, and others' observations,[41] the crux of the matter is that the New Woman is investigated in the same negotiation as the *artificial alien* Alraune and her fellow artificial beings populating early German silent cinema, and, indeed, as the cinematic image itself. Both the women's movement and the medium of film were seeking legitimacy at the time by not only examining what it means to be human but also by demanding to be recognized as human. "The new woman," Herrmann further explains,

> is therefore *no artificially conjured phenomenon,* consciously conceived in opposition to an existing system; rather, she is *organically* bound up with the economic and cultural developments of the last few decades. Her task is to clear the way for equal rights for women in all areas of life. That does not mean that she stands for the complete equality of

> the representatives of both sexes. *Her goal is much more to achieve recognition for the complete legitimacy of women as human beings*, according to each the right to have her particular physical constitution and her accomplishments respected and, where necessary, protected" (208; my emphasis).

Although for different reasons, the existential question of what it means to be human lies at the core of discourses on women's rights, test tube babies, and the nature of cinema. Here, these diverse realms intersect, as the following discussion will further trace, via their negotiations of *Menschenbildung*.

*Homunculus*, likewise, negotiates the issue of the human by responding to the contemporary war carnage of 1914 to 1918. The film series received its premiere at the Marmorhaus in Berlin in the midst of World War I, namely in the early summer of 1916. Episodes 1-4 premiered during the second half of the year, parts 5 and 6 during the first two months of the following year (1917). The narrative, which gradually shifts its focus from Homunculus's search for love (parts 1–3) to his desire to annihilate mankind (parts 4–6), parallels the escalating violence that characterizes the years 1916 and 1917. Part 4, "Die Rache des Homunculus," for example, premiered on December 1, 1916, just two weeks after one of the bloodiest combats of World War I, the Battle of the Somme,[42] had come to a final standstill. In Germany, the German army's inability to capture crucial victories two years into the conflict, the rapidly rising and inconceivably high count of casualties and dismembered veterans returning from the trenches, and the growing impact the fighting had on civilian lives gradually resulted in disenchantment with the war. While Rippert's film series responds to these historical developments in different ways, understanding Homunculus as an incarnation of warfare appears to be the most obvious reading. In his famous 1947 study on Weimar cinema, *From Caligari to Hitler. A Psychological History of the German Film* (1947), Siegfried Kracauer concludes that "[i]n elaborating his further career[—from outcast and impostor to dictator and warmonger], the film foreshadows Hitler surprisingly" (32; cf. Eisner 110). While *Homunculus* appears to be one of the more obvious examples that motivated Kracauer to categorize Weimar films as pre-fascist artefacts, Kracauer moreover argues that "[t]he Germans resembled Homunculus: they themselves had an inferiority complex, due to an historic development [namely having failed in establishing a democratic society through revolutionary means as the French and English could claim for themselves respectively], which proved detrimental to the self-confidence of the middle class" (33).

While one can easily relate to Kracauer's analysis, *Homunculus* arguably foreshadows less than it reacts to and comments on the cultural and historical moment of its making. Following in the interpretative footsteps of Anton Kaes, Rippert's *Homunculus* is, then, a first attempt at processing the Great War and its traumatic effects through cinematic means. In *Shell Shock Cinema. Weimar Culture and the Wounds of War*, Kaes demonstrates how Weimar films[43] come to terms with the unprecedented scale of the horror of the First World War as well as Germany's ultimate defeat (cf. "Shell Shock" 3).

> [T]hese films translate military aggression and defeat into domestic tableaux of crime and horror. They transform vague feelings of betrayal, sacrifice, and wounded pride into melodrama, myth, or science fiction. They evoke fear of invasion and injury, and exude a sense of paranoia and panic. These films feature pathological serial killers, mad scientists, and naïve young men traumatized by encounters with violence and death. They show

> protagonists recovering from unspeakable events both real and imagined, and they document distressed communities in a state of shock. (Kaes, "Shell Shock" 3)[44]

Like these iconic films haunted by war and trauma, the science fiction series *Homunculus* features mad scientists; a protagonist with mythical origins who is easily a role model for any pathological serial killer; a community that is paralyzed by the intrusion of a non-human being, by violence that is so traumatic that it cannot be depicted, and by mourning for lost lives and a past normality.[45]

*Homunculus* thus attempts to work through trauma in the midst of catastrophe, to make sense of the industrialized technologization of modern warfare and apocalyptic mass dying, and to cope with the desire to see war come to an end without losing it. These issues are negotiated—and hence framed in similar terms as in *Alraune*—via the question of what it means to be a functioning, productive member of society—of what it means to be human. "You are not a human being, if you do not believe in love," Homunculus's opponent, Sven Fredland (Theodor Loos), preaches when he sets out in the fourth episode "to reunite mankind through love." While Fredland's message persuades Margot to switch allegiance and break up with Homunculus, the latter not only rejects Fredland's reconciliatory handshake and embrace but ultimately murders his adversary. Hence, Homunculus poses a threat to a peaceful, prosperous existence in numerous ways. Significantly, the film's emphasis on failed relationships, murder, and warfare points to anxieties about a decline in population. "During the present era of auxiliary means and a shortage of human life, the question materializes anew,"[46] one contemporary reviewer of *Homunculus* noted, suggesting his excitement about the possibility of artificial creation ("Homunkulus" 26). At a time when mass killing was a stark daily reality; invalid, shell-shocked men returned from the front in droves; and the knowledge of generations lost could no longer be ignored, the question of potentially replacing people through artificial means appears to be rather a valid query than simply an interesting idea.[47] Hence, *Homunculus*, I argue, is, at the least, a *Gedankenexperiment*[48] and, at the most, an effort in *Menschenbildung* via cinematic means, a technology that is perhaps even more about possibility than imitation.

## "Homunculi" in the Making: Points of Intersections between Science and Fiction

While *Homunculus* and *Alraune* thus engage with numerous cultural discourses—not only responding to but also giving expression to anxieties about historical events or social changes, both films furthermore intersect with scientific research and practice prevalent at the time of their respective production. Galeen's *Alraune*, for instance, not only explicitly mentions but also models ten Brinken on Russian-French surgeon Serge Voronoff (1866–1951).[49] In the film, ten Brinken, a "world-famous authority on genetic cross-breeding," effectively legitimizes his experiments and their validity by arguing that "we must continue in the direction indicated by Doctor Voronoff with his genetic experiments" during a public lecture on the power of modern science to carry into effect the medieval legend of the mandrake.[50] Voronoff gained prominence during the 1920s and 1930s for his gland-grafting treatments, which promised to reverse humans' natural aging process. He transplanted, for example, testicle tissue from chimpanzees into men's scrotums. The treatment, Voronoff believed, had rejuvenating effects on his patients: the procedure, he and his supporters claimed, increased sexual prowess, and the grafting of the animal testicles improved men's physical and mental performance. In *Life. A Study of the Means of Restoring* (1920), Voronoff

explains how the idea to transplant body parts for the purpose of restoration can be found in a legend of the Middle Ages, yet only modern science recently allowed for its successful execution (cf. 63–64). He also discusses the advantageous possibility of using executed criminals and victims of accidents as organ donors (cf. 85–86). Besides grafting monkey testicles, Voronoff experimented equally with transplanting chimpanzees' ovaries into human female bodies. However, he really grabbed the public's attention in the summer of 1926 when he switched up the procedure. As *Time* magazine reported in an article entitled "Science: Ape-child?," Voronoff "had grafted within Nora, a mature female chimpanzee, the sex organs of a human female. Then, with assistance of Dr. Elie Ivanoff of Moscow, he had artificially impregnated Nora with human sperms. She was to bear her baby in January and it would be, biologically, a human child" ("Science: Ape-child?").[51]

While Voronoff and his experiments, often promoted via public performances, had, arguably, the greatest influence on *Alraune*, other important advancements were made in the field of ART—primarily the practice of artificial insemination—at the turn of the twentieth century. In 1878, Austrian embryologist Samuel Leopold Schenk harvested mammalian eggs from rabbits and guinea pigs, and attempted to impregnate them outside the females' wombs in a Viennese laboratory. Schenk's main interest in in-vitro, artificial insemination originated in his inability to observe processes in a natural setting and, thus, to produce visual footage such as drawings of these transactions. He, like many of his colleagues, hoped to produce lifelike images of the maturing organisms in the Petri dish, which were thought to develop like their naturally conceived counterparts. In vitro fertilization, the technique by which an ovum is fertilized by sperm outside the womb, originates in Schenk's trials.[52] As Schenk[53] explicates in his essay "Das Säugethierei künstlich befruchtet ausserhalb des Mutterthieres,"[54] the newly discovered technique of artificial impregnation performed under the microscope facilitated the observation of an ovum's early development—life cycles that are indiscernible to the human eye when developing naturally. The success of his experiments, however, posed a new problem for Schenk: the inability to follow the maturation of an ovum under natural circumstances prevented Schenk from knowing if the artificially fertilized egg deviated from eggs inseminated naturally.[55] In these instances, technological advancements, on the one hand, allowed making natural processes visible through the means of artificial reproduction. These experiments, on the other hand, contributed to blurring the boundaries between naturally and artificially created life, or lifelike life, and raise questions about differences inherent to these forms of existence as well as the visibility of such dissimilarities.

Only ten years after Schenk first experimented with mammal eggs and IVF, Paul Levy published his dissertation *Über die Ausführung der künstlichen Befruchtung am Menschen,*[56] which examines the treatment and its effectiveness. Levy mostly refers to French case studies and debates, and ultimately cautions against using this method for humans until further studies with animals have been undertaken (35). Significantly, as Christine Schreiber explains, "Gynecologists [at the time] denoted 'künstlicher Befruchtung' not as fertilization outside the body but as insemination" (102).[57] After 1900, physician and sexologist Hermann Rohleder wrote several books on the subject, ultimately doing pioneer work for ART in Germany; his books on the subject wonderfully demonstrate how ART treatments in humans are intrinsically linked to the use of artificial insemination for the breeding of plants and animals.[58] Rohleder's 1911 *Die Zeugung beim Menschen. Eine sexualphysiologische Studie aus der Praxis. Mit Anhang: Die Künstliche Zeugung (Befruchtung) beim Menschen*[59] garnered quite the attention (cf. Benninghaus 378). Rohleder, who later completed a monograph on the reproduction of humans,[60] was thus part of a lively debate

about artificial insemination, which he ultimately recommended as treatment in certain, rare cases.[61] As Christina Benninghaus demonstrates, this debate around 1912 involved medical, ethical, and social concerns that were discussed by doctors, legal experts, advice booklets, and authors (such as Hanns Heinz Ewers); "Articles meant to popularise scientific findings regarding this issue were especially likely to mix arguments and contexts" (378). Indeed, the debate, Benninghaus emphasizes, was rather vigorous in view of the treatment's rare use and low success rate (cf. 381), and misgivings often pervaded the discussion.[62] She argues that—despite the apparent lack of technical equipment and little and often unsuccessful usage—"artificial insemination was perceived as a scientifically sound technology"[63] (388) and, indeed, "imagined as a way or [sic] creating life artificially" (375; cf. 389).[64]

The existence of children conceived via artificial insemination prompted physician Otto Adler[65]—already in 1908[66]—to debate their legal, social, and hereditary status in his article, "Homunculus. Medizinisch-juristische Betrachtungen über die künstliche Befruchtung."[67] To distinguish babies born as a result of this "newly" practiced ART from children conceived naturally, Adler names these children "Homunculus" and "Homuncula"—a term he further defines as "artificial human" (194).[68] The existence of "Homunculi" children causes Adler to ponder questions about parentage and guardianship: if a child is conceived by means of artificial insemination, who is the baby's father? This issue arises because artificial insemination, according to Adler, disposes of sexual relations with a male partner:

> Our laboratory doesn't look very mystical, it's only sparsely equipped, and nonetheless, to ensure that we do not underestimate the first artificial step in our Homunculi activities, we must stress, in no uncertain manner, that we, to create a human child, went without one thing that until now appeared to be essential for becoming human, namely male sexual intercourse. (199)[69]

The possibility of conceiving without having sexual intercourse with a man—indeed, without having the man in the same room, Adler explains, raises questions about paternity, consent, and familial bonds.[70] In other words, the medical practice of artificial insemination marks a decisive break in biological, reproductive processes that consequently upsets kinship relations, social and legal obligations, and traditional rituals.[71]

Besides engaging impartially with the topic, Adler's article, published in the socio-scientific journal *Geschlecht und Gesellschaft*, stands out for its cross-disciplinary, unconstrained composition.[72] Most notably, Adler effortlessly connects the medical procedure of artificial insemination to fictional accounts of creating human beings. By christening these children "Homunculi" and speaking of a "laboratory,"[73] Adler draws a clear connection to Johann Wolfgang von Goethe's Homunculus, "a sort of test-tube human spirit" (Wellberry 547). In Goethe's *Faust II.* (1832), Faust's student, Wagner, works on creating a human being via alchemical means—an endeavour that comes to fruition when Mephistopheles visits the ambitious scholar in his "laboratory" one day: "Mephistopheles: 'What might it be?' / Wagner: '... A man is being made.'"[74] Goethe's depiction of Wagner's alchemical experiments is a direct response to a concrete scientific breakthrough conducted by chemist Friedrich Wöhler in 1828. Wöhler, devoted to turning inorganic matter into organic material, synthesized urea from inorganic substances, a process called "crystallize"[75] at the time (Drux 92–93). Accordingly, Goethe used the term to describe the making of Homunculus: "What men as Nature's mysteries would hold, / All that to test by reason we make bold, / And what she once was wont to organize, / That we bid now to

crystallize" (206).[76] This genesis of Homunculus "from substances a hundred fold" (206) has thus generally been read as "an abiogenesis according to alchemistic principles" (Drux 93).[77] While Goethe's Homunculus, who is considered to be the prototype of any subsequent artificial human character populating German culture (cf. Drux 91), is intrinsically tied to the historical and cultural context of alchemical thought, the making of the Faustian Homunculus nonetheless points to a future that is characterized by the possibilities bio-engineering offers: it is, as Manfred Osten argues, "the palimpsest of a startling modernity in the wake of bio- and nanotechnological phantasmagoria" (13).[78]

In a similar move, Adler links this fictional past with the realities of the present to a fantastic future: "[A] Homunculus from the vial will not want to be anything less than his natural fellow human being" (200).[79] In his examination of the diverse social and legal consequences of ART, Adler speculates that if the "Homunculi" were to feel discriminated against on account of their artificial origin, "the population of Homunculi will increase, they will unite, they will establish a union, they will speak in front of their king, their parliament, and they will request, perhaps even obtain by forceful means, their legitimacy" (200).[80] Any such confrontation between "natural" humans and their "Homunculi" relatives is, as Adler explains, currently subject to the imagination of (fantasy) writers only. Adler's rather narrative contemplation of a cultural clash between humans and "Homunculi," like his references to Goethe, exemplifies a certain fluidity between literary accounts of (past and future) artificially created human beings and case studies of ART as practiced in laboratories and doctor's offices in the real world. It also points to the significance of fictional *Gedankenexperimente*.

As a matter of fact, Adler's brief envisioning of a violent clash between "Homunculi" and their naturally conceived counterparts had been imagined by Robert Hamerling twenty years earlier. In his 1888 satirical poem "Homunkulus; Modernes Epos in zehn Gesängen,"[81] the Austrian poet tells the story of the misshapen Homunkulus who ultimately turns against the rest of humankind by unleashing a hate-filled attack. Hamerling's Homunkulus, naturally, echoes Goethe's Homunculus in *Faust II*. However, Hamerling changes the making of his Homunkulus in significant ways. In a first step, an alchemistically created "Homunkel," an elderly dwarf-like creature jumping out of the alembic, instantly lectures his erudite creator about the shortcomings in the execution of his genesis: "Spoke of albumin a lot, / Of fibrin, of globulin as well, / Keratin, mucin and of other things, / And of proper mixture, / And instructed his maker / And creator thoroughly, how he should have/ done it better."[82] The erudite scholar, in the face of Homunkel's malformed appearance and morbid health, decides to re-create his work by adjusting his procedure. Abandoning alchemistic principles, he places his first Homunkel back into the vial, "[r]educes him to the very first / the urprinciple of vital life, . . . To the embryonic state, / To a rationally mixed, / Frail protoplasma-clot," and implants the "embryo" into the womb of a schoolmaster's wife "[i]n a secret manner."[83] After nine months, Homunkel 2 is born, "[f]ully developed and well-formed / alive and healthy, the fragile / prodigy, the non-conceived one."[84] In short, Hamerling's description of the making of a "Wunderkind," remarkably published the same year as Levy's dissertation, features an alchemical "test tube embryo," surrogacy, and even a form of selective reduction.[85] "He envisaged what was to come," Rudolf Steiner attested regarding Hamerling in a lecture in Berlin in May of 1916 (290), calling the poet a "Seher-Gestalt" ("seer-figure"; 284) and Homunkulus a "homo oeconomus."[86]

By naming babies born as a result of ART "Homunculi"; building his argument on Faustian as well as Paracelsian passages;[87] and, moreover, imagining a future, violent clash between

"Homunculi" and their naturally conceived counterparts if the former receive no equal rights, Adler not only makes sense of ART children's irrevocable existence but also frames them within a larger evolutionary history that marks an otherwise indiscernible difference, their artificial reproduction. In other words, Adler draws genealogical ties by *relating* science's and fiction's respective creations. By fictionalizing real "Homunculi" children, and materializing fictional "Homunculi" beings, he uproots the split relationships that commonly characterize science and art, and reality and fantasy. Despite obvious differences, Goethe and Hamerling likewise blur the boundaries between these spheres in their respective accounts of *Menschenbildung*. "Humans have strived to create artificially what nature has to offer," says Adler, succinctly summarizing one of the driving forces behind this desire to reproduce artificially (193).[88] Implicitly, these texts and their underlying arguments then pose the question of what role film will take in molding the *Menschenbildung* project and its "Homunkuli."

## Shaping Homunculi: *Menschenbildung* in the Cinema

Hamerling's Homunkulus is ultimately reproduced when Rippert adapts Austrian screenwriter Robert Reinert's *Homunculus* script for the big screen[89]—which brings this discussion back to the two key scenes from the film series and *Alraune*, described at the beginning of this chapter. They point to the way film has profoundly shaped this mutual, scientific and artistic sphere of *Menschenbildung* and its three dimensions. In these scenes, both films comment on cinema's unique ability to bring artificially created life into existence when recounting Homunculus's and Alraune's conception: the secret of their artificial creation is initially recorded in written format, yet the truth about their ART origins and resulting adverse consequences is only made visible and perceptible through filmic images. The switch from text—book property and intertitle—to moving image not only proves Homunculus's and Alraune's existence but it actually brings both of them to life.

This relationship between text and image, invisibleness and visibility, as well as ignorance and knowledge is mirrored in explanations of the Human Genome Project, which was launched in 1990. A team of international researchers published the full sequence of the human genome in April 2003. Francis Collins, the director of the National Human Genome Research Institute (NHGRI), marked the milestone of having mapped a large majority of human DNA in February 2001 with the words:

> Last June, we announced that researchers had collected 90 percent of the DNA letters that make up the text of the human genome sequence. Now we have achieved another major advance – by reading, from cover to cover, the first draft of this "Book of Life" … this Book of Life [sic] is actually at least three books. It's a history book: a narrative of the journey of our species through time. It's a shop manual: an incredibly detailed blueprint for building every human cell. And it's a transformative textbook of medicine: with insights that will give health care providers immense new powers to treat, prevent, and cure disease. We are delighted by what we've already seen in these books. But we are also profoundly humbled by the privilege of turning the pages that describe the miracle of human life, written in the mysterious language of all the ages, the language of God.[90]

While Collins's announcement signals a major breakthrough for genetics, it is moreover noteworthy in the ways it connects biology and science to print and the arts. To unlock the mystery of the human genome, Collins and his fellow scientists, described here as god-like creators, turn to letters and text—their legible, reproductive capacities and cultural functions—to make visible, as well as visualize, the human body's inner mechanisms.[91] Life is thus composed of the molecule deoxyribonucleid acid, DNA; two or more atoms, tied together by chemical bonds, make up a molecule. The majority of DNA molecules contain two polymeric biomolecules (biopolymer) strands; these two strands, spiralled around each other, constitute a double helix. Biopolymers are formed from nucleotides: these contain nucleobases, namely either cytosine (C), guanine (G), adenine (A), or thymine (T). They, or rather their sequence, store and translate biological data, which ensures the reproduction and development of life. For instance, ATCGTT might make blue eyes, ATCGCT, on the other hand, brown eyes.[92] The human genome is, in short, a biological entity that is translated into a cultural, legible code. Its translation then allows for the deciphering of historical, constructional, and instructional information about life and living. In August 2017, developments in the modification of genes—scientists managed to manipulate a particular gene to eliminate a certain type of heart disease, hypertrophic cardiomyopathy[93]—once again stirred up a debate about (the limits of) genetic engineering, genome editing, and the potential of "'edited children'" (Belluck).[94]

Genetic science has continuously inspired a wide variety of artists. The fact that the way "life comes from life" (Francis Crick in Watson et al. 264) has been explained by scientists in terms of chemistry and printing from the very beginning may partially account for this. A case in point is Joe Davis's *Malus ecclesia*, a literal, growing tree of knowledge as Davis encoded Wikipedia into the genome of an apple: "The apple genome can be thought of as a seven-hundred-and-fifty-million-letter book, made of the four letters of DNA: a, t, c, and g. The process of inserting Wikipedia resembles taking a pen and writing in the margins and between the lines" (House). Joan Haran et al.'s 2007 book *Human Cloning in the Media* demonstrates that this captivation by all things genetics plays out in all sorts of media platforms and texts (e.g., books, websites, newspapers, art exhibits etc.). Genetics has especially been a source of inspiration for filmmakers: an obvious indication of this fascination is the vast array of movies that engage with the topic in some form or another. As Jackie Stacey, also mentioning *Human Cloning in the Media* here, sums up,

> [t]he flood in the past twenty years of films about genetic engineering and cloning intensified in the decade of the clone [mid-1990s to mid-2000]. One study suggests there were five times as many cloning films released in this decade compared with the previous one; [W. J. T.] Mitchell (2005) suggests that there have been well over a hundred such films released in the last two decades alone (12).

Stacey's own study of the specific ways in which scientific advancements in fields such as cloning, bioengineering, or digital technology and the fears and promises evoked by these technologies take shape on the cinematic screen delivers valuable insights for the further discussion on the role of cinema for *Menschenbildung*.[95] Examining "the mid-1990s to the mid-2000s" (11), Stacey describes the specifics of these connections as "genetic imaginary," "a set of very tangible anxieties surrounding the reconfiguration of the boundaries of the human body, the transferability of its informational components, and the imitative potentialities of geneticized modes of embodiment" (8). She defines the "genetic imaginary" as "the mise-en-scène of these

anxieties, a fantasy landscape inhabited by artificial bodies that disturb the conventional teleologies of gender, reproduction, racialization and heterosexual kinship" (8). By analyzing films such as *Alien: Resurrection* (1997) and *Gattacca* (1997), Stacey explores how advances made in genetic sciences, such as decoding the human genome, cloning, and genetic engineering, alter our understanding of concepts such as naturalness, identity, sameness, authenticity, sight, and the body. The cinema, Stacey argues, emerges as the perfect means to speculate about the nature of genetic sciences and surrounding anxieties and potentialities because it also pursues the reproduction of life and is heavily invested in techniques of imitation. In her words, she studies how "the visual pleasure of one technology (cinema) … produce[s] a critique of another (cloning)" (xi). Films belonging to the "genetic imaginary," Stacey concludes, make use of, as well as create, a unique aesthetic. This carefully constructed look finds expression in designs that, for instance, mirror the double helix and its spiral composition. Specifically, "[b]lending architectural forms with an emphasis on sequence, repetition, and symmetry, these films give the interiority of the genetically engineered bodies an integral place within the mise-en-scène, producing what we might call a geneticized aesthetic: a distinctly spatialized sense of the gene on the screen" (7).

Stacey captures and crystallizes these diverse strands in what she calls the "cultural double take," "a shared sense of perplexity that generates the desire to look again at that which cannot be assimilated within existing perceptual habits and frames of reference" (258). The "cultural double take of the genetic imaginary" (257) is primarily defined in terms of recurrence:

> The notion of the double take combines two concepts indicative of broader concerns at the heart of this project. … *the double* has appeared variously as the clone, cyborg, look-alike, impersonator, impostor, replicant, fraud, photograph, perfect match, adult offspring, identical twin, monster, and copycat. *The take* is uninterrupted recording of something, such as a film sequence, that is almost always repeated: take two, take three, take four – until a satisfactory version has been achieved. Both an imperative and a noun, it registers the acquisitive desire of image making. To take requires, and in turn allows, a repeat performance. The double and the take are copies of different kinds; put together as the double take, they signal the necessity of repetition generated by something unnerving. Extended as the cultural double take, they combine a generalized sense of the interruption that prompts an involuntary return. The compulsion to repeat what we cannot absorb has us looking back for impossible certainties. In the face of our doubles, where are we to find ourselves? (emphases in original, 259)

Stacey's engagement with the "cultural double take of the genetic imaginary" raises further questions, one in particular: to what extent are the relationships and frameworks she examines and develops in her study themselves a recurrence? In other words, where and when are the "genetic imaginary" and the "cultural double take" at work outside the "decade of the clone?" To what extent is the "genetic imaginary" itself a return of an earlier manifestation? And what would such a previous appearance mean for our understanding of technologies invested in biological and cultural reproduction and their mutual relationship? Indeed, "where are we to find ourselves" among the ancestors of our cinematic and artificially conceived doubles?

Stacey's concept of the "genetic imaginary" echoes Susan Squier's earlier analysis of the relationship between reproductive technology and rejuvenation therapy, "the two forms of RT" (94), and literature. "[B]oth forms of RT," Squier states, "are the subject of a phantasmatic investment whose dimensions and implications can be gauged by looking at their representation

in imaginative literature" (94). While Squier and Stacey primarily discuss the relationship between scientific developments and practices and literature and cinema, respectively, as the arts critiquing the sciences at particular historical moments, I argue that this connection between ART and cinema moves beyond critique: it is, I claim, a union that is deeply intertwined, mutually dependent, and reciprocal. "How does one create an artificial human being?" a reviewer asked in 1916, and answered:

> This problem's solution has occupied scholars for a very long time. One wants to substitute the fruit of love with a physico-chemical surrogate. During the present era of auxiliary means and a shortage of human life, the question materializes anew, and what the doyen Goethe contrived in "Faust" as Homunculus shall now become reality – on film. There, one can put the wildest thought into action, "Homunculus" will take shape. Even if his form is none that is tangible, it is, however, one that is visible, explainable, graspable ("Homunkulus" 26).[96]

This review of Rippert's *Homunculus* points to this more intimate, equal bond: film, it asserts, *realizes* artificial human beings. In this way, cinema is not merely a technology of imitation but of creation and reproduction of (artificial) life.

Cinema's potential to create life is ultimately acknowledged and celebrated in early reactions to moving images.[97] As Mark B. Sandberg shows in *Living Pictures, Missing Persons: Mannequins, Museums, and Modernity*, enthusiasm for cinema's ability to animate dominated, for instance, Scandinavian descriptions of film's peculiarities. "Not dead pictures, without life and movement," a first account read, "but a world that lives and moves altogether as it does in reality" (qtd. in Sandberg 9). A Swedish observer fervently explained his cinematic experience as being "completely surprised to see the photograph fully alive. In one picture, for example, we see the workers streaming out of a factory. These are not automata we see there in front of us, but fully living figures—every little movement, every twitch of a muscle stands out so clearly that we seem to see the picture in real life" (qtd. in Sandberg 9). In his evaluation of these early reactions to the newly developed cinematic technology, Sandberg emphasizes that—for then-moviegoers—"these were not dead images but living, breathing, twitching images. To these viewers," Sandberg suggests, "the bodies did not seem mediated by technology (they were not 'automata') but organic and natural instead" (9).

Cinema's power to bring people into being—"[t]he linen comes to life" (qtd. in Sandberg 9)—also enthralled German audiences. Reviewers often used the same phrase—"come to life"—to describe moving images.[98] The movies "rise up into a feeling for life" (Hasenclever in Kaes et al. 40), "comprehend the essence of life" (Hofmansthal in Kaes et al. 384), and "many films contain significant contemporary historical events, memorable moments from the history of peoples, which appear with a vibrant and lifelike vividness and which certainly merit being passed on to posterity" (Sommer in Kaes et al. 29). "When we watch images of boats floating on the open sea, of a train speeding towards us, or of workers performing various tasks in a foundry or in a glassworks, all of this appears so true to nature that we no longer even notice the lack of color," one critic wrote, "The shimmering blue snow, the cold sky, and the silent actions of the tired people slowly ascending the mountainside were all so beautiful, so enthralling that one could no longer see it as a performance but only as a real event" (Hood in Kaes et al. 147–148).

As Sandberg notes when comparing Scandinavian and Russian reports on early cinematic viewing experiences, the reactions to moving images was not a homogenous, universal affair: "Viewers in that [Russian] cultural setting seized upon the aspects of the film image that conveyed loss—the loss of speech, of color, of dimensionality—and embraced the cinematic medium more for its estrangement effects than for its power of revivification" (8). The fact that Alraune is described as "ghost" mirrors these impressions. Responses to early cinema were thus mixed, ambiguous, and culturally embedded, and they ranged from all-embracing enthusiasm to outright condemnation, from experiencing cinematic images as "living images" to viewing them as "dead pictures." Georg Lukács aptly captured this ambivalent nature of film in this 1913 critique of the cinema:

> [T]he cinema becomes uncannily lifelike. Not only in their technique, but also in their effect, cinematic images, equal in their essence to nature, are no less organic and alive than those images of the stage. Only they maintain a life of a completely different kind. In a word, they become *fantastic*. This fantastical element is not a contrast to living life, however, but is only a new aspect of the same: a life without the present, a life without fate, without reason, without motives, a life without measure or order, without essence or value, a life without soul, of pure surface, a life with which the innermost of our soul does not want to coincide; nor can it. … The world of the 'cinema' is thus a world without background or perspective, without any difference in weight or quality, as only the present gives things fate and weight, light and lightness. (qtd. in Kaes et al. 378)

Lukács's theoretical reflections on the nature of theatrical performances and cinematic images thus outline distinct differences between these two experiences. While he emphasizes that both—the stage as well as the cinema—are part of, and take part in, life being reproduced, their difference, respectively, lies in the resulting essence that is distinctively different for the stage and film. In the case of cinema, life reproduced on screen is characterized by dominating physicality that comes along with absolute soullessness. For Lukács, these cinematic reproductions are, moreover, "fantastic" in nature—a characteristic that does not take away from their life-likeness but rather defines it. Lukács's description of cinematic life thus resembles Stacey's later definition of the cinematic "fantasy landscape" that is "inhabited by artificial bodies" (Stacey 8). It also evokes W. J. T. Mitchell's argument that "the notion of images as life-forms always equivocates between questions of belief and knowledge, fantasy and technology, the golem and the clone" in *What do Pictures Want? The Lives and Loves of Images* (295). Based on Freud's notion of the "uncanny," Mitchell terms the place in which these images live "middle space" (295).

These manifold diverse, and yet similar, efforts to make sense of life reproduced on screen, however, suggest that cinema indeed provides a space that is not only populated by fantastic bodies but that, as I argue, *generates* them. Cinema, thus, not only films ART life into being but it is moreover ART life—*art*. The two earlier discussed scenes of *Homunculus* and *Alraune* point to and, indeed, perform this artificial reproduction in the moment they transform the textual origins of both protagonists into sudden visible and moving life. By showing them—*screening* them, the camera not only awakens these artificial beings but also proves their existence and, most importantly, their humanity. This artificial reproduction of human life on the screen—like the reproduction of children conceived via ART in the laboratory—comes, however, at a price: cinematic test tube babies—that is, the moving image of a human being—appears to have lost a crucial trait of their humanity in the process of creation: their soul.

While questions such as what exactly a soul is, where it is located, and how it looks are answered differently and vaguely,[99] debates about test tube babies, cryo and edited children, Homunculi, and (cinematic) images share a common denominator in their explorations of difference and sameness, namely the idea that *art* manifests itself in an absent or degenerate soul and/or heart. This adverse consequence, the common DNA of *art*, is, for instance, aestheticized by Alraune's shadow. The reproductive, ghostlike doubling of Alraune points to the reproduction that cinema itself undertakes, and evokes Walter Benjamin's thoughts on an artwork's aura. Benjamin arrives at a definition of "aura" by observing first that any reproduced work of art is characterized by a deficiency: "the here and now of the work of art – its unique existence in a particular place" is lacking in a reproduction ("The Work of Art" 21). For Benjamin, the original work of art has a "unique existence" because it has a history, which is shown by changes in its material body, and the tradition inherent in the work of art. The absence of history results in a lack of authenticity. Ultimately, the means of technological reproduction and the emergence of the masses, Benjamin argues, have resulted in a fundamental transformation of the nature of the artwork and its social functions. Benjamin's theoretical concept evokes Adler's thoughts on the changed ritual of sexual intercourse and Homunculi children's genealogy. Stacey relies on Benjamin in answering the question as to whether "geneticization [is] to the body what digitization is to the image" (175). Stacey argues that the genetically engineered body has lost its "bio-aura":

> If the word 'aura' can be understood as an affective and present relational connection between bodies and artifacts, bio-aura might be thought of as a sense of the transmission of humanness based on genealogical, integrated, and unmediated vitality. By extension, as the inhuman counter to bio-aura, genetic engineering threatens to taint human reproduction with a loss of authenticity, transforming our perception of the life-giving processes of the human body into a set of scientific techniques in which the promise of life is haunted by a deathly presence. (183)

The shadow that emerges at the moment Alraune learns of her ART origins a is arguably a visualization of the concept of "bio-aura" and its deathly counterpart; simultaneously, it also demonstrates cinema's own investment in reproductive technology and the power it wields over reshaping the nature of a work of art and its relationship to its surroundings.

Contemporary scientific research into the essence of the "soul" mirrors these connections and the compelling desire to make the soul and its "aura" visible. Starting out with the assumption that the soul is (part of) the brain, scientists attempt to localize functions associated with the soul in the brain via image technology. The body's movement plays an important role in regard to these questions, according to Goetz and Taliaferro in their *Brief History of the Soul*:

> To ensure clarity about what is at issue, consider one more example of movements of our bodies that, according to soul-body dualism, could only be adequately explained by mental causation exercised by a soul whose choice is teleologically explained by a purpose or reason. Right now, each of us is tired and feels tight in his back after typing for several minutes, so we raise our arms in order to relax. Reference to our mental activity and our purpose for acting seems not only helpful but also necessary to explain both the movements of our fingers on the typewriters while we are typing and the subsequent motions of our arms when we relax. If we assume for the sake of discussion that we, as souls, cause our fingers and arms to move by directly causing some neural events in the motor sections of

> our brains, then, when we move our fingers and raise our arms for one purpose or another, we must directly cause initial neural events in our brains that ultimately lead to the movements of those extremities. In other words, in order to explain adequately (teleologically) the movements of our limbs, there must be causal openness or a causal gap in each of our brains. (Goetz and Taliaferro 161–162)[100]

According to philosophers such as "Plato, Aristotle, Augustine, and Aquinas," "the soul was by definition that which gives life," and a body without a soul was therefore not alive (Goetz and Taliaferro 156). This traditional understanding reinforces the relationship between soul, movement, and life that the above example also demonstrates in simplified terms. While Goetz and Taliaferro acknowledge that "[t]here is a prevailing assumption that we human beings and other animals are thoroughly physical-chemical realities" (1), they set out to demonstrate that "under healthy, ordinary conditions, the embodied soul functions as a unity. When you genuinely express and embody your actual thoughts and feelings, there is a singular reality, not two remote worlds being 'harnessed' together" (185–186). The conflict between dualistic soul-body explanations, "thoroughly physical-chemical realities," and "embodied souls" provides insight into the way the cinematic image, as well as ART children, evoke cultural anxieties but also possibilities. The cinema emerges as the first site that convincingly shows artificial difference as well as human sameness—diverse realities as one reality—by animating soul and body, and life and death.[101]

The soullessness of Weimar's test tube babies brings us back to the absence of a soul that, allegedly, characterizes Louise. While the writer of the postcard relied on a grainy image to visualize Louise's Otherness, the camera present at her birth verified her human normalcy and sameness. The use of ultrasound during Lesley's pregnancy, film technology during her caesarean section, and the photo of Louise is reminiscent of Galeen's, Ivanoff's, and Voronoff's use of images. In *Alraune*, ten Brinken proves the existence of his "daughter" to his nephew, Frank Braun (Iván Petrovich), with a photograph of her. Moments before viewing the photo—which appears blurrier, fuzzier towards its edges, Frank, who eventually becomes Alraune's savior, picks up the mandrake root, slowly turning it in his hands. Here, the photo, as an artificial reproduction of a cinematic test tube baby but also scientific-magical experimentation, quickens and verifies *art* existence. Likewise, photos of horses served Ivanoff as proof of successful artificial inseminations (Iwanoff).[102] In his discussion of his rejuvenating experiments with sheep and goats, Voronoff rejects any doubts about the effectiveness of his treatment of grafting sex glands by ensuring his readers that he has witnessed the transformation of his test animals with his own eyes. While Voronoff, in theory, acknowledges that humans' perception may indeed be subject to error as a result of an overactive imagination, he dismisses any such mistake on his part and further substantiates his claim by relying on photographs as proofs: "[i]t is equally impossible for me to admit any error of interpretation when I see the picture – fixed by my camera – of an animal castrated at the age of six months, and grafted a year later, showing an amorous ardor to which the female is complaisantly lending herself" (81).[103] Voronoff's remark about the sexual vigorousness that supposedly emanates from the grafted animal and that the camera captured, aptly points to the camera's capability to also make visible any manifestations, changes, and abnormalities that are not easily perceptible, and that are thought to have occurred as a result of artificial manipulation. In other words, images can make things concrete that otherwise escape perception—indeed, things that are open to interpretation and even the imagination. The camera thus provides the essential

means to render visible artificial life's human essence as well as its othered artificiality, not only on screen but also in the lab.

To conclude, test tube babies demonstrate in diverse ways how artificial reproduction in biology and the arts are related processes that influence and complement each other mutually. At a time when artificial insemination was gradually becoming a recommended treatment, and cinema was slowly establishing itself as a popular entertainment, the existence of these technologies and their creations, which embody and evoke similar cultural anxieties, had to be explained and negotiated. While Stacey connects the proliferation of films dealing with bioengineering and cloning during the "decade of the clone" to the explosion of scientific developments during the same period, the "genetic imaginary" has, I believe, a much longer history than traced in *The Cinematic Life of the Gene*. Negotiations about artificial reproduction of humans in biology and the arts are about *Menschenbildung*; they take place in the lab and on screen, and via scientific, fictional, and social avenues. Moving pictures essentially quicken test tube babies, making them a reality by visualizing their humanness as well as their Otherness. These (processes of) creation(s) are sites of knowledge production, as they explore again and again: What does it mean to be human in the age of *art*?

Films such as *Homunculus* and *Alraune* and surrounding discourses demonstrate vividly that the meaning of humanness is open for debate. This also holds true for the meaning of artificiality and technology, for science and art. In these debates, meaning is defined by making visible sameness as well as Otherness; Homunculus and Alraune emerge as ideal sites for these negotiations because they look human inside and out and are created artificially in a twofold manner. Test tube babies thus function as a means of expressing anxieties about inhumanity (war), survival (demographics, degeneration, and gender roles), and technologization (technology, cinema, ART). These incidents of "cultural double takes" suggest that the "uncanniness" of Homunculus and Alraune stems from an uneasiness about our own existence and nature. The aestheticization of these potentially adverse consequences comes to the point in the "soul." "Take me away from here. Give me another soul, and a heart so that I might become a human being, and love like one," Alraune desperately pleads at the very end of the film. While others read this ending as "happy," I view it as less optimistic: Alraune's final plea signals defeat and uncertainty. The film's ending thus stands in for German culture's ambiguous, mixed relationship with artificially reproduced life, be it in the form of test tube babies or life forms created on the cinematic screen. In other words, German silent cinema's test tube babies are a *coming to terms with art*. The various incarnations of Homunculus and Alraune embody this process of making sense: Homunculus is created twice in the film but he is also created as film; Alraune is doubled as plant and shadow but also returns to the movies in Richard Oswald's 1930 *Alraune* film. Having reached a new evolutionary stage of artificial reproduction, Alraune can now talk—the sound film has conquered the screen. Test tube babies are here to stay; they have negotiated their place among us. Yet, the fact that Oswald's film ends with Alraune's death suggests that anxieties surrounding *Menschenbildung* have to be negotiated time and again.[104] Most importantly, test tube babies in German Silent Cinema demonstrate that discourses about *art* are, in fact, also about test tube babies. On screen, they answer back to us: "In the face of *our* doubles, where are *we* to find ourselves?"

## Notes

1 Such warnings have remained an integral part of consent forms commonly used for IVF and related procedures (cf., for example, Boston IVF's "Consent Form for In Vitro Fertilization"), and the question of increased risks of birth defects and other complications continues to be a popular and hotly debated research topic in reproductive sciences (cf. Davies et al.; Hansen et al.; Rimm et al.; Wen et al.).

2 The Del-Zios' wish to have a child via IVF was ultimately destroyed when the treatment was brought to an abrupt halt by Raymond Vande Wiele at Columbia Presbyterian Hospital and Medical Center in New York after learning that the Del-Zios' doctors, William J. Sweeney III and Landrum Shettles, had failed to obtain ethical approval prior to starting the experimental procedure. The Del-Zios eventually won a lawsuit against Wiele, the hospital, and Columbia University, as Wiele's destruction of the culture of Doris's eggs and John's sperm samples in a test tube caused the couple severe emotional distress (cf. Bamford 1-5; Henig; "Test Tube Babies"; Powledge (Powledge's report includes an excerpt from Aldous Huxley's *Brave New World* 16-17)). The trial, which only began in July 1978, would have likely had a different outcome if it had taken place in previous years: at this point, it was no longer debatable that IVF could result in a successful pregnancy and live birth (cf. the following paragraph).

3 The term "assisted reproductive technologies," ART—or A.R.T.; or "medical assisted reproductive technology" (MART); as well as "technology"; and, sometimes, "assisted reproductive techniques"—commonly refers to "all treatments or procedures that include the in vitro handling of both human oocytes and sperm or of embryos for the purpose of establishing a pregnancy. This includes, but is not limited to, in vitro fertilization and embryo transfer, gamete intrafallopian transfer, zygote intrafallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation, and gestational surrogacy" (Zegers-Hochschild et al. 1521). This standardized terminology by the World Health Organisation (WHO) from 2009 specifically excludes "assisted insemination (artificial insemination)[, namely] using sperm from either a woman's partner or a sperm donor [only]" (Zegers-Hochschild et al. 1521). While different definitions and ART practices remain in use, the American Centers for Disease Control and Prevention as well as health officials in the European Union recommend the use of the same denomination ("What is Assisted Reproductive Technology?"; Sorenson 1). Previously, ART was generally labelled "reproductive technologies," which are historically and medically linked to intrauterine insemination (IUI) procedures—as well as to other, even sometimes future reproductive treatments (cf., for example, Gena Corea's *The Mother Machine. Reproductive Technologies from Artificial Insemination to Artificial Wombs*). For the purpose of the following discussion—particularly to tease out the intersections between artificial reproductive processes in the sciences and the arts, ART here denotes this broader understanding of the term: it describes any process of conception and birth that takes place outside of natural processes and as a result of human intervention and technology. This more comprehensive definition allows for clearly highlighting the commonalities between biological and cultural reproduction and for establishing a level playing field between the different disciplines (as Squier and Littlefield point out repeatedly in "Feminist Science Studies," this later issue is often not yet addressed by current research).

4 All of the major parties involved in this first successful IVF live birth have written about their experiences: besides research notes and academic publications (cf. Elder and Johnson "The Oldham Notebooks I.-VI."; Steptoe and Edwards "Birth after the Reimplantation of a Human Embryo"), Robert G. Edwards, who received the Nobel Prize in Physiology or Medicine for his ground-breaking ART work in 2010, and Patrick Steptoe, who passed away in 1988, gave a non-academic account in their 1980 book *A Matter of Life. The Story of IVF – A Medical Breakthrough*. While Louise Brown recently published her own biographical recount, *Louise Brown: My Life as the World's First Test-Tube Baby* (Powell), her parents already told their side of the story in 1979 (Brown et al.).

5 National and international media outlets quickly christened Louise with sobriquets that underlined the role that ART played in her conception, and that often reflected anxieties about this type of medical intervention. While Lesley Brown was sometimes referred to as "test tube mother," Louise's most commonly used nick name was "test tube baby" (cf., for instance, Beresford 1; "First 'Test Tube Baby' Born"; "Test Tube Baby. Birth Gives Hope to 15,000" 1, 3 & 21; "The Test Tube Baby. Birth Watch in Britain;" Powell, especially 31-46 & collection of covers between 120-121). These reports also emphasized Louise's normalcy: the baby, in Patrick Steptoe's words, "'came out crying its head off and breathing very well,'" and "'[i]t was a beautiful, normal baby'" ("Test Tube Baby. Birth Gives Hope to 15,000" 3). Objections, as these articles show, were primarily raised by religious—especially Catholic—leaders. A couple of years later, Lesley Brown had another daughter, Natalie, via ART; Natalie went on to be the first person conceived via IVF to have children. The first American IVF baby,

Elizabeth Jordan Carr, was born on December 28, 1981. Oliver W. was the first German "Retortenbaby," born on April 16, 1982.

6 Howard W. and Georgeanna Jones opened the first IVF clinic at Eastern Virginia Medical School in 1979; Elizabeth Jordan Carr was conceived and born here.

7 Cf. the Introduction.

8 The Wellcome Library in London—which specializes in the study of medical history—holds several recordings of Louise's birth; a video news release is available via the Wellcome Library's YouTube channel and, as of today (2017), is the collection's most popular clip with over 280,000 views ("First test tube baby Louise Brown. Video news release"). The filming of Louise's birth was organized in cooperation with governmental agencies (Central Office of Information for the Department of Health and Social Security). While Louise underwent over 60 different tests to discover any abnormalities as soon as she was born, the camera arguably becomes here a vital medical testing device in itself. Ultrasound, which was introduced as a common procedure in British hospitals in the 1970s (cf. Nicolson and Fleming 3 & 7), was also used to track Lesley's pregnancy and fetal growth. The technological possibility of taking an ultrasonic image of the fetus is closely linked to the development of film technology and the subject under discussion here.

9 The following episodes were part of the series: "Homunculus" or "Die Geburt des Homunculus" ("The Birth of Homunculus"), "Das geheimnisvolle Buch" ("The Mysterious Book"), "Die Liebestragödie des Homunculus" ("Homunculus's Tragedy of Love"), "Die Rache des Homunculus" or "Der Hass des Maschinenmenschen" ("The Revenge of Homunculus" or "The Hatred of the Machine Man"); "Die Vernichtung der Menschheit" ("The Annihilation of Mankind"), "Das Ende des Homunculus" ("The End of Homunculus"). The series was re-edited (shortened) and re-released in 1920. The re-release consists of three parts: "Homunculus. Der künstliche Mensch" ("Homunculus. The Artificial Human Being"), "Die Vernichtung der Menschheit" ("The Annihilation of Mankind"), "Ein Titanenkampf" ("A Battle of Titans") (cf. Quaresima 160). It was believed for many years that neither the six episodes—with the exception of the fourth part—nor the 1920 re-edited version was available in its entirety. Scholars recently discovered not only that the existing fourth part only contained 2/3 of the original installment but also further footage, a shorter version in Italian and another one in a Russian archive (cf. Franke). Film historian and director of the Filmmuseum München, Stefan Drößler, restored the film in recent years (cf. Franke; Thompson and Bordwell); this restored version, mostly resembling the 1920 cut and still a work in progress, was first shown at the 2014 Stummfilmtage in Bonn. The 2014 program featured *Homunculus* as its cover ("Internationale Stummfilmtage"; cf. also 27).

10 *Mandrake*, or also known as *A Daughter of Destiny* and *Unholy Love*. The film is based on Hanns Heinz Ewers's novel *Alraune. Die Geschichte eines lebenden Wesens* (1911; *Mandrake. (The Story of a Living Being)*). While the film was made in 1927, it premiered in Berlin on January 25, 1928. Like *Homunculus*, the film was a hit with audiences (cf. Weinstein 208). Moreover, the tale of the mandrake root and/or the character of Alraune fascinated filmmakers during the first few decades of the twentieth century: Eugen Illés first dealt with the topic in his 1918, now lost, film *Alraune, die Henkerstochter, genannt die rote Hanne* (*Alraune, the Hangman's Daughter, Called the Red Hanne*); during the same year, Michael Curtiz made the film *Alraune*; *Alraune und der Golem* (*Alraune and the Golem*) by Nils Chrisander premiered in 1919; and Richard Oswald's *Alraune* in 1929/1930. In 1952, Arthur-Maria Rabenalt turned to the topic once more (Alraune played by Hildegard Knef and ten Brinken by Erich von Stroheim); a short film was produced in 1984 (*Versuchsreihe Alraune* (*Test Series Alraune*)); and, most recently, Alraune was featured in the final part of the three-part horror movie *German Angst* (2014).

11 Cf. the Introduction.

12 "Ich bin kein Mensch wie die andern."

13 *Homunculus* made Danish actor Fønss (also Fönss) into a popular movie star—his wardrobe in the film apparently started a fashion trend (Kracauer 32; this trend appears to apply to subsequent portrayals of superheroes and their use of capes, too), and his pay at the time seems to have been the highest ever paid to a silent film actor in Germany (cf. "Homunculus" in Lichtbild-Bühne 18). "Fønss ist ein Darsteller mit außerordentlichen Ausdrucksmitteln, dessen hinreißendes Temperament alle Klippen, die sich der logischen Durchführung seiner Rolle [des Homunculus] entgegenstellen, überwindet" ("Fønss is an actor with exceptional expressive skills, whose captivating temperament overcomes any trials posed by the logical performance of his role [of Homunculus];" "Homunculus" in *B.Z. am Mittag*).

14 Quaresima points out that the 1920 version was not able to garner the same success as the series version in 1916 (166-167).

15 This flashback, in a way, combines fact and fiction: it shows "actual" footage from Homunculus's birth from earlier installments but, as it is presented through Margot's eyes and thus renders her imagination visible, also points to its visionary qualities.

16 The fact that the scene excludes any women is reflective of male's desire to give birth, which is, as Christine Kanz argues in *Maternale Moderne: Männliche Gebärphantasien zwischen Kultur und Wissenschaft (1890-1933)* a common motif between 1890 and 1933. Based on this demonstration, it is noteworthy that Christine Kanz discussing primarily Metropolis in her chapter entitled "'Babymakers' im Stummfilm" ("'Babymakers' in Silent Film") in *Maternale Moderne. Männliche Gebärphantasien zwischen Kultur und Wissenschaft (1890-1933)* ("Maternal Modernity. Male Fantasies of Birthing between Art and Science") does not mention the ART "babies" Alraune and Homunculus, although both films are deeply invested in the scientific discourse of "babymaking" and, through cinematic technology, also generate them.

17 The film shows ten Brinken repeatedly logging Alraune's development in his journal; some entries are shown via intertitles.

18 It is noteworthy that Galeen opted to not depict the actual making of Alraune in the laboratory, which only appears as a mysterious room in the background, featuring ten Brinken in a lab coat opening the doors. Rather, the film begins with the telling of the legend of the mandrake, which ten Brinken vows to investigate via scientific means. These scientific means, different scenes suggest, comprise an approach combining medieval, mythical ideas and genetic scientific theories, modern animal breeding practices, and laboratory equipment such as test tubes. Ten Brinken's experiment also includes human subjects, namely the (involuntary) involvement of a criminal (sperm "donor" for Alraune) and a prostitute as her biological mother.

19 The scene evokes F.W. Murnau's 1921/1922 Expressionist masterpiece *Nosferatu. Eine Symphonie des Grauens* (*Nosferatu. A Symphony of Horror*), specifically the iconic shadow sequence, which shows Nosferatu's shadowy hands on Ellen's white nightgown, seemingly clutching her heart. This scene thus represents the film's most explicit characterization of Alraune as vampiristic.

20 As will be further discussed below, Johann Wolfgang von Goethe's Homunculus figure, from his tragic play *Faust* (1808 & 1832), has had tremendous influence on German culture and its subsequent investment in artificially created (human) beings. It should thus be noted that Rippert's Margarete is, of course, an allusion to Goethe's Margarete/Gretchen tragedy: in *Faust*, Gretchen is characterized as a pure, inexperienced maiden who, though willingly, is seduced by the erudite scientist Faust, and ultimately pays for her misguided love and resulting sins with her death.

21 Besides Dr. Hansen, Professor Ortmann, as well as their assistant Rodin, are involved in Homunculus's creation. When Ortmann's own newborn child dies, he switches the babies, bringing up Homunculus as his own son.

22 On March 18, 1910, the Edison Company released the first cinematic adaptation of Shelley's novel—and, arguably, the first horror film. *Frankenstein*, directed by James Searle Dawley and approximately a quarter of an hour long, features Charles Stanton Ogle as the monster, Augustus Phillips as Frankenstein, and Mary Fuller as his bride. The monster, emerging from a huge cauldron after Frankenstein, whose "mind's evil" comes up with the idea of creating a "perfect human being," and who conducted alchemistic procedures in a closet-like laboratory, certainly carries humanoid characteristics but cannot be mistaken for a human being; its appearance is too monstrous. While part of the film's unsettling impact stems from the monster's obsessive love for his creator, the film also stands out for its, at the time, ground-breaking special effects (e.g. use of skeleton, fire, smoke, mirrors). In fact, early filmmakers, playfully experimenting with the seemingly magical possibilities of the new technology, gravitated to subject matters that were alchemical or scientific in nature: at the turn of the century, Georges Méliès, for instance, produced several films featuring Faust.

23 Cf. below for a more detailed discussion of the films' relationship to World War I. and Weimar culture, respectively. The trope of the "mad scientist" is particularly interesting insofar as it shows the power of literary and cinematic fiction: these fictional scientists, many of them dreamed up by German-speaking authors and filmmakers as well as based on the idea of the evil Nazi scientist, are often not only better known and more familiar to us than real ones but they have also had a greater impact on prevalent cultural ideas on researchers and their work (cf. Haynes, *From Faust to Strangelove* 1-2, 4; "Whatever Happened to the 'Mad, Bad' Scientist?" 31; Frayling 12-16). For Roslynn D. Haynes, "the prototypical scientist of counter-culture exemplified intellectual hubris. Arrogant, secretive and dangerous, his obsessive focus on his research rendered him contemptuous, even oblivious, of society's norms and relationships. The master narrative of the mad scientist consistently presented him as a dangerous over-reacher, determined to transcend human limitations and precipitating a wave of retributive events. This character was pivotal in subverting the 'great men' account of science, enacting instead our nightmares that new, secret knowledge may misfire or be deliberately misused. He was depicted as mad, partly

because he was not amenable to reasoned discourse, but also because, from Roman times, genius was linked with insanity as symptomatic of an unbalanced nervous system" ("Whatever Happened to the 'Mad, Bad' Scientist?" 33). Not surprisingly, the desire to create a human being—via alchemy to cloning—has been the main obsession of these scientists. As Haynes points out, only recently have literature and cinema provided more positive characterizations of scientists: she credits this shift in the portrayal of literary and cinematic scientists to a change in perception of real scientists in the public eye who have increasingly been perceived as positive figures for, among other things, environmental causes, infertility treatment, and mathematical applications (cf. "Whatever Happened to the 'Mad, Bad' Scientist?" 35-42). Moreover, "[t]here are now alternative 'competitors' for that role [of the stereotypical bad scientist]: insane gunmen, religious fanatics, terrorists, extortionist companies, destroyers of the environment and passionate, violent adherents of many persuasions from animal rights to right-to-life protesters. Since 2001, we have learned to fear most the terrorism and fanaticism arising from political systems and fundamentalism and, underpinning them, the unpredictable madness of despotic or fanatical leaders. As before, the psychology of the unbalanced, evil mind is the real and abiding source of fear, but this is no longer attributed to scientists. The 'popularity' of the mad scientist as both fictional character and movie star has declined because we no longer need him. The new face of terror is the terrorist (Haynes, "Whatever Happened to the 'Mad, Bad' Scientist?" 42). Cf. Frayling for an extensive overview of the "bad scientist" in the cinema.

24 Cf. Haynes, *From Faust to Strangelove* 1-2, 4; "Whatever Happened to the 'Mad, Bad' Scientist?" 31; Frayling 12-16.

25 Cf. Frayling for an extensive overview of the "bad scientist" in the cinema.

26 "Das durchaus platte Fazit, was sich anhand dieses Serienfilms ziehen ließe, lautet," Tanja Nusser concludes, "Die zweiten Schöpfungen sind nicht menschlich und unterliegen deshalb nicht menschlichen Gefühlen, sie haben keine Moral und sind die potentiellen Feinde des Menschen, auch und obwohl sie ihm gleichen. Wenn aber der Feind und Fremde nicht mehr vom Freund und Eigenen zu unterscheiden ist, dann sind wir verloren."

27 *The Woman of Tomorrow We Wish for*

28 "Krise der neuen Freiheit"

29 "erotische Freiheit;"

30 It is noteworthy that awareness of male infertility, or rather awareness of how common it is, increased dramatically during these years (cf. Benninghaus 385).

31 Cf. Richard McCormick's *Gender and Sexuality in Weimar Germany* for a detailed discussion of this subject.

32 It is worth emphasizing here that Brigitte Helm portrayed both Maria/Maschinenmensch and Alraune. Moreover, she resumed the role of the latter in Richard Oswald's 1930 film adaptation by the same name. Cf. Daniel Semler on Helm.

33 In *Metropolis*'s case, this is the film's notorious striptease dance scene, in which the artificial "Maria's" erotic dancing seduces the city's men. This famous, innovative episode is mirrored in Galeen's film when Alraune seductively dances for ten Brinken. Consecutively, ten Brinken re-envisions this performance: the slowly rotating, humanoid mandrake root shown earlier as one of his prized possessions turns into the spinning figure of Alraune (this final visual is reminiscent of a ballerina music box).

34 Mihaela Petrescu "examines how Weimar cinema used modern social dances as a key signifier for conveying the seductiveness of the femme fatale and how the same films systematically staged a domestication of the vamp through the narrative renunciation of dance" (277). Galeen's and Oswald's Alraune, as well as *Metropolis*'s Maschinenmensch, are the perfect cases in point, even though they play out quite differently. While giving up dancing, Petrescue argues, allows Galeen's Alraune to enter the domestic sphere, "Fritz Lang's *Metropolis* (1927) and Richard Oswald's sound version of *Alraune* (1930) present vamps whose movement can be controlled only through destruction either because they do not change (*Metropolis*) or because their transformation cannot undo their criminal influence (*Alraune* 1930)" (278). Cf. 281 for description of Helm's typical vamp dance moves; 285-290 for discussion on the significance of dancing for both Galeen's and Oswald's films.

35 Cf. Andreas Huyssen who examines the way *Metropolis* depicts technology in terms of femininity and, thus, represents femininity as a threat to social stability if not contained. The main facilitator of these negotiations in the film, which, as Huyssen compellingly demonstrates, also include the cinematic medium, is the male gaze: "Vision as pleasure and desire has to be subdued and manipulated so that vision as technical and social control can emerge triumphant" (232). Cf. Mulvey's "Visual Pleasure and Narrative Cinema" for the term "male gaze," which Huyssen clearly relies on in his analysis (230).

36 The incestuous undertones of Alraune's relationships underscore the implications of mentally disordered deterioration.

37 The most notable case in point is Fritz Lang's *Metropolis*'s Maschinenmensch, as others, for example Barbara Hales in "Taming the Technological Shrew: Woman as Machine in Weimar Culture," have argued. Hales argues that two defining characteristics of the femme fatale are the criminal and the double. It appears then that Alraune embodies what Barbara Creed termed the "monstrous-feminine," a female monster "defined in terms of her sexuality. The phrase 'monstrous-feminine' emphasizes the importance of gender in the construction of her monstrosity" (3). She further argues that "when woman is represented as monstrous it is almost always in relation to her mothering and reproductive functions" (7).

38 Hoffmann's *The Sandman* tells the story of the young student Nathanael, who falls "madly" in love with the automaton Olimpia, the daughter of Professor Spalanzani. Eyes are this nineteenth-century fantastic tale's dreadful leitmotif: it features Olimpia: "ihre Augen [hatten] etwas Starres … keine Sehkraft, … als schliefe sie mit offnen Augen" (chapter 4; "indeed there was something fixed about her eyes as if … she had no power of sight. It seemed to me that she was sleeping with her eyes open" (translation by John Oxenford)); Nathanael's fiancée Clara with her, initially, "holdlächelnde[…] Kindesaugen" ("those bright, smiling, childish eyes"; chapter 4); a mysterious solicitor with "grünliche Katzenaugen" ("a pair of green cat's eyes"; chapter 2) and a sinister salesman of optical devices; the fairy-tale, and nightmares, of the Sandman who throws sand in children's eyes so that the eyes jump out of their heads; alchemical rituals with "Menschengesichter ringsum sichtbar, aber ohne Augen—scheußliche, tiefe schwarze Höhlen statt ihrer" ("human faces lying around without any eyes—but with deep holes instead"; chapter 2); and an enigmatic pocket telescope that, for instance, allows Nathanael to voyeuristically observe Olimpia through the window from afar: "immer lebendiger und lebendiger flammten die Blicke" ("her glances flashed with constantly increasing life"; chapter 4). For Nathanael, the characteristics that make up Clara's eyes at the beginning of the story are gradually taken on by Olimpia, and vice versa. Huyssen, for instance, links *Metropolis*'s Maschinenmensch—as well as his argument about the relationship between technology and women as a signifier of destruction—to automatons (225).

39 In *Media, Modernity and Dynamic Plants in Early 20th Century German Culture*, Janet Janzen examines the aspect of mobility in *Alraune* in terms of social class and status (cf. specifically 186-187). Notably, Petrescu concludes that "the Weimar films discussed here – [among them *Alraune* (Galeen and Oswald) and *Metropolis*], under the influence of historical and ideological changes in the 1920s and 30s, tend to depict the movement – and above all the dance of the vamp – as restricted by narrative containment and to domesticate, destroy, or ultimately transform that movement back into stillness" (278).

40 As to the context discussed here, the relationship between the New Woman, movement/mobility, and film evokes Gotthold Ephraim Lessing's 1766 *Laocoon* essay, in which he sets forth his view on the difference between literature and visual arts. For Lessing, poetry is at its best when it depicts action, because words describe their subject matter consecutively in time. Painting and sculpture, on the other hand, portray objects that coexist in space. "[D]ie Zeitfolge ist das Gebiete des Dichters, so wie der Raum das Gebiete des Malers" ("succession in time is the province of the poet, co-existence in space that of the artist"; chapter 21). Lessing's analysis of the Laocoon Group to distinguish literature and fine arts provides one potential angle to ponder the nature of film; the way cinematic art brings together time and space, action and body; and the portrayal of beauty on the screen. The cinematic New Woman emerges as an ideal embodiment of this potential mergence. Cf. Mülder-Bach for an in-depth analysis of the relationship between picture, movement, and illusion/reader & viewer response in Lessing's *Laocoon* and in the work of Lessing's contemporaries. The significance of cinema's ability to show physical movement in time and space in relation to ART will be further analyzed below.

41 "By combining a close reading with attention to discussions of race, heredity, and the New Woman in the Weimar era, theories of the horror film, and Sigmund Freud's 'Uncanny,' I will show," Weinstein argues convincingly, "how Alraune preys on fears of racial pollution and anxieties about the New Woman and debunks science as an effective source of knowledge" (198). Hans centers her analysis on both Galeen's and Oswald's *Alraune* films: she reads the differences in Alraune's portrayal and storylines as commentary on changed attitudes towards women's gender roles in Weimar society, as well as symptomatic of changes in cinematic conventions. In his comparative analysis of Hanns Heinz Ewers novel and Galeen's as well as Oswald's films, Ofer Ashkenazi shows how the two films, both made by Jewish filmmakers, comment on the integration/assimilation of Jews into German society during the first decades of the 20th century. For Ashkenazi, Alraune—as well as Brigitte Helm who was often described by contemporary reviewers as "Aryan" (the emphasis on her "White" features connects Alraune/Helm to the racial Whiteness of genetically modified protagonists Jackie Stacey discusses (cf. 14))—presents the stereotypical "Jewish" Other. However, as Ashkenazi demonstrates convincingly, the films negotiate "Jewish" Otherness not only in terms of anti-Semitism but primarily also the potential and impossibility of integrating/assimilating into mainstream urban bourgeois German society (cf. below for further discussion of the

ending of Galeen's *Alraune*, which Ashkenazi, as well as Petrescu (288), in contrast to my own reading, views as happy). Janzen centers her analysis on the film's engagement with plants as sites of cultural negotiation of social change: "*Alraune* represents the demonic plant as a transgression of a stable order that must be punished" (159). Cf. Nusser's discussion on primarily Ewers's novel but also the diverse incarnations of Alraune in German cinema (163-187).

42 The Battle of the Somme lasted from July until November 1916 and cost over 1.5 million lives.

43 Kaes's analysis include films such as *The Cabinet of Dr. Caligari* (Robert Wiene, 1920); *Nosferatu, a Symphony of Horror* (Friedrich Wilhelm Murnau, 1922); *Die Nibelungen* (Fritz Lang, 1924); and *Metropolis* (Fritz Lang, 1927).

44 *Homunculus* has been gradually receiving more attention in recent years; it is to be expected that the recent restoration of newly found footage will garner scholars' further interest. Leonardo Quaresima views Rippert's series as "one of the most important documents, if not a key film for German film production of the teens" (160; cf. 165). He particularly praises the series for its use of (Expressionist) lightening and shadows, and links *Homunculus*, as a formidable predecessor, to the later classic films of Weimar Cinema. For him, Homunculus's vampiristic depiction literally foreshadows Nosferatu's portrayal (cf. 161). Quaresima thus echoes Lotte Eisner's evaluation of the film series (cf. 224). Gerald Bär's discussion centers on Homunculus, along with golems and mandrakes, as the embodiment of the doppelgänger motif (starting at page 635). Nusser, in her impressive overview of literary and cinematic representations of reproductive technologies, also briefly discusses Rippert's *Homunculus* as an example of male fantasies of creation in the cinema (94-97). Nicholas Baer "propose[s] a different nexus between Judaism, tales of creation, and the technologically reproducible medium of cinema" and, compellingly, "read[s] the films[, *Der Golem, wie er in die Welt kam* and *Homunculus*,] as allegories for the formation of a new Jewish man and the foundation of a modern Jewish nation-state" (35). Cf. Dahlke and Karl in regard to summary of the film series (32); Thompson and Bordwell for a discussion of the recently restored version.

45 Cases in point are Margot's emotional separation from Homunculus and, moreover, her grief for her new partner, Sven Fredland, which mirror the gradual disenchantment with modern warfare that befell Germany, its people's increasing war weariness, as well as the devastating sorrow for a lost generation of young men that took hold of the country. Margot's mourning for Fredland, whose death significantly is not explicitly shown, literally translates into anguish over the loss of a peaceful status quo—"fred" is Swedish for "peace." The fact that the 1920 version appears to have ended with a battle between Ortmann and a newly created Homunculus further links the series to "shell shock" films, as it puts emphasis on how war often ends in self-destruction—a precise comment on Germany's status quo at the time.

46 "In der jetzigen Epoche der Hilfsmittel und des Menschenmangels taucht die Frage von neuem auf."

47 The event of World War I may serve as an explanation for why *Homunculus* was made in 1916, instead of *Alraune*. While the film's literary source material, Ewers's novel, was published in 1911, Homunculus, as the personification of war, suggests the possibility of producing (human) reinforcements artificially, and his characterization, as well as that of other male characters in the series, reveals the extent to which cultural anxieties about the state of men dominated this era. Anxieties about demographic development, however, already existed prior to the war; ART was thought to play a potential part in alleviating them (Benninghaus 382-385). Additionally, it is worth noting that German film's first artificial beings were imagined to be male: in 1914, *Der Golem*, released in the same year that Gustav Meyrink published his novel as a series by the same title; in 1917, *Der Golem und die Tänzerin* (*The Golem and the Dancing Girl*); and, in 1920, *Der Golem, oder wie er in die Welt kam* (*The Golem: How He Came into the World*, 1920). Paul Wegener directed and played the golem in all three films. Henrik Galeen also worked on both the 1914 (directing, script, acting) and 1920 films (script).

48 Cf. Introduction.

49 While Voronoff attracted numerous patients, his work was often ridiculed by his contemporaries; however, "it is tempting … to label Voronoff a quack and a charlatan, but there is considerable evidence that he was a man whose vision exceeded the medical science of the time" (Cooper and Lanza 25-26). Cf. Jean Réal for a biographical account of Voronoff. Voronoff is moreover a case in point for a scientist appearing in and influencing popular culture. He is, for instance, also featured in Mikhail Bulgakov's *The Heart of a Dog* (1925). He is not mentioned in Ewers's 1911 novel.

50 According to the legend—and ten Brinken—the mandrake (root) grows where the last sperm of a hanged man drops down onto the soil. The plant has been used as an aphrodisiac, infertility treatment, painkiller, sleeping aid, and good luck charm. Cf. about the legend, the characteristics and historical use of the plant, and its prevalence in literature: Gassen and Minol; Hambel. Mirroring Voronoff's and his colleagues' well-known public

performances, ten Brinken, gland-grafter as well as a pioneer geneticist, lectures to a group of interested students and fellow scientists while holding a vial in his hands and presenting several rabbits, alive as a result of artificial insemination. In a way, the film represents itself as a lecture to the audience, who watch the experiment of Alraune unfold on the screen.

51 Susan Squier notes, however, that Voronoff's "overall goal was not to induce pregnancy, but rather to mitigate the painful symptoms of aging (Voronoff, Sources 111). While Nora shared with the rest of the graft recipients the condition of being postmenopausal, the rest of the recipients were human women, who had chimpanzee ovaries grafted into them as a rejuvenation treatment" (89). However, Ivanoff was a specialist in artificial insemination who repeatedly attempted to create a human-ape pregnancy. His work was well-known in Germany (cf. Benninghaus 376).

52 Cf. Christine Schreiber's historical account on IVF prior to 1950 and Christina Benninghaus on German debates about artificial insemination around 1912.

53 At the time, Schenk, as well as his peers, did not realize the significance of his experiments. Years later, the embryologist gained fame for his theory on influencing the sex of an unborn child: depending on the amount of sugar contained in a woman's diet, she would either have a boy (sugarless diet) or a girl (diet contains sugar).

54 "The Mammalian Egg Artificially Fertilized Outside of the Dam"

55 Cf. Schreiber for a detailed discussion of Schenk and his experiments.

56 *Observations on Human Artificial Insemination*

57 "Gynäkologen [zur damaligen Zeit] verstanden unter 'künstlicher Befruchtung' keine Befruchtung außerhalb des Körpers, sondern eine Insemination." At the time, artificial insemination generally meant the following process: "the couple arranged to have sexual intercourse normally in the days immediately following menstruation [as doctors, erroneously, believed this to be a woman's most fertile window]. The sperm was collected in a condom and kept warm. It was injected into the vagina or the uterus by a doctor using a syringe. As the sexual arousal of the woman was believed to further the fertilisation and as the sperm was supposed to be used while still fresh, it was believed that the insemination had to be done immediately after intercourse" (Benninghaus 381-382; cf. Adler 199).

58 Cf. Andrea Hommel for a detailed account of Rohleder's life and work; also Benninghaus.

59 *Human Reproduction. A Sexual-Physiological Study, Gained in Practice. With Appendix on Artificial Reproduction (Fertilization)*

60 *Die Zeugung beim Menschen* (*The Reproduction of Humans*)

61 It is noteworthy that Rohleder also examined the possibility of creating a hybrid between man and ape in his 1918 published monograph (also cf. Hommel 144-147). In 1917, Franz Kafka published "Ein Bericht für eine Akademie" ("A Report to An Academy" in *Die Erzählungen*), in which Rotpeter, the ape, details his becoming human. And Alraune is often associated with animals (fly, mouse, lion).

62 "While French gynaecologists appear to have been fascinated by the possibilities of artificial insemination, German and British experts were rather sceptical," Benninghaus points out (375). Benninghaus's main argument is that artificial insemination became a topic of interest at this point in time because of a shift in understanding infertility.

63 In view of the debate on artificial insemination around 1912, and Benninghaus's arguments, it is noteworthy that artificial insemination—today designated as IUI—is the first standard response to an infertility diagnosis and treatment with donor sperm. Additionally, the "Turkey Baster Method" often constitutes the method of choice for fertile women attempting to become pregnant at home without sexual intercourse (a syringe is usually used instead of a turkey baster). Moreover, some of the characteristics that describe the medical practice of artificial insemination in its beginnings still hold true for ART treatments today: for instance, ART is often used despite prevailing ignorance of the precise workings of natural conception, procedures, and medications; in cases of unexplained/undiagnosed infertility; and unease, discomfort, and low success rates characterize much of ART treatments. Some couples and parties also reject IUI treatment today as they view it as "unnatural" and, indeed, "too artificial and technological." In other words, certain features of the actual treatment, processes, and surrounding concerns have remained much the same and are not specific to its beginnings.

64 In her compelling analysis of *Alraune*, Weinstein shows that the film "debunks science as an effective source of knowledge" (198). She explains that "[s]cience and the horrific narrative merge thematically and stylistically as the film progresses, and the imbrication of horror and realist claims, superstition and science, is accompanied throughout the film by the use of techniques associated with Expressionism and the New Objectivity. This mixture of styles in *Alraune* highlights the event the film locates at the intersection of superstition and science: genetic crossbreeding. Alraune is a product of this genetic crossbreeding" (199). While Weinstein's analysis is

convincing, her discussion is based on the assumption that artificial insemination belongs strictly into the category of science. This discussion hopes to show that ART is always itself a "crossbreeding;" it emerges from points of intersections, such as magic, alchemy, and science, or human and animal, or reality and imagination, or diverse opinions and angles. In this way, Rohleder's grievance "that the German public knew little about this technology (162) and cited *Alraune* as an example of public's ignorance (156)" also shows (science) fiction's role in the ART cultural sphere as a means of knowledge construction (Weinstein 202; Rohleder *Test Tube Babies*).

65 Adler was involved in Magnus Hirschfeld's Ärztliche Gesellschaft für Sexualwissenschaft und Eugenik (Medical Society for Sexual Science and Eugenics).

66 October 1, 1908, is the first day ten Brinken makes an entry in his journal about Alraune.

67 "Homunculus. Medical-Legal Observation on Artificial Insemination"

68 "der künstliche Mensch"

69 "In unserer Werkstatt sieht es wenig mystisch und noch sehr dürftig aus und doch, um den ersten künstlichen Schritt unserer Homunculustätigkeit selbst nicht allzu gering einzuschätzen, müssen wir es klar und deutlich betonen, daß wir für die Bildung unseres Menschenkindes eins entbehrten, was bisher unerläßlich für jegliches Menschenwerden schien – die männliche Beiwohnung."

70 A year after the publication of Adler's article, American doctor Addison Davis Hard revealed in his article "Artificial Impregnation" how, in 1884, Dr. William Pancoast conducted an artificial insemination with sperm donated by Hard; the woman who gave birth to a child nine months later was not informed of the third party involved (Gregoire and Mayer). It is noteworthy that the question of who might be a child's mother does not arise in the context of artificial insemination. Nowadays, this issue is also of concern, as donor eggs, surrogacy, and mitochondrial donation have become part of ART treatments.

71 Such as marital intercourse. Benninghaus notes that the 1912 debate rarely addressed if children conceived via artificial insemination were abnormal (cf. 384). However, it seems that the unclear, questionable familial relationships that characterize ART children circumscribe abnormal Otherness here, and non-medical texts, such as *Homunculus* and *Alraune*, certainly explore this issue even further. Moreover, the relative unimportance attributed to physical and mental abnormalities in these early debates might also be explained by a shift in understanding children's personhood. Additionally, it appears that discussions of ART in the beginnings primarily centered on the process, rather than the outcome, namely a live birth. This process, however, was often described in terms of unpleasant abnormality: as Benninghaus notes, "[t]he repeated use of attributes like 'unaesthetic', 'awkward' or 'mortifying' in these texts is quite striking" (387). To some degree, this perception provides one explanation for Galeen's decision to omit the specific details of Alraune's creation. Instead, he initially shows the prostitute anxiously waiting in the scientist's study, which features an impressive assortment of creepy facial masks, human skulls, and other grotesque visual art. The room's uncanny furnishing, exposed by several close-ups, foreshadows the abnormalities associated with ten Brinken's experiment—as the reaction of Alraune's selected mother demonstrates, they signal nothing but terror. An opening double door eventually reveals ten Brinken in a white lab coat, turning up his sleeves, and a bright, sterile-looking operating room (cf. Weinstein 202, 204-205 for a slightly different reading). Furthermore, the responsible censorship authorities in Berlin discussed the suitability of the film and specific scenes for the general public a few days prior to its premiere. They concluded "dass es bedenklich sei, die Entstehung des Menschen durch künstliche Besamung auf die Leinwand zu bringen, wodurch in allen Menschen, die abseits von der modernen Wissenschaft leben [sic] eine Flut ungesunder, sie aufwühlender Gedanken und Empfindungen hervorgerufen und eine sittenzerstörende Wirkung auf das Gefühls- und Empfindungsleben einfacher Menschen ausgeübt werde" ("It is questionable to bring the creation of man through artificial insemination onto the screen, because people, through this depiction, who have no knowledge of modern science, are exposed to a flood of unhealthy thoughts and emotions that make them anxious and have a morally damaging effect on the emotional mood and life of simple people"; "Zensurgutachten vom 20. Januar 1928" 5). An earlier decision by the censorship authority had already prohibited the screening of the film for an adolescent audience ("Zensurgutachten vom 16. Januar 1928").

72 *Gender and Society*. The journal, progressive and liberal in its orientation, covered a diverse range of topics, "from historical surveys of erotic literature and sexual symbolism in art, to anthropological explorations of practices such as prostitution and marriage, and as time progressed — the journal appeared for slightly more than two decades, with its final issues published in 1927 — an increasing focus on science, with articles on topics such as homosexuality or the chemistry of the sex drive" (Lang and Sutton 178). Adler's essayistic composition is reflective of the journal's overall approach to covering topics as well as writing style: "it was, above all, the 'high' cultural realms of literature and the fine arts that provided the preferred discursive means by which contributors worked to revise the boundaries of dominant bourgeois respectability and thereby redefine the 'centre' or 'norm'

of German public discourse on sexuality. Contributors relied on their readers sharing knowledge of, and respect for, European cultural traditions, while also using a canonical platform to protect their discussions from censorship. Aesthetic discourses were thus attributed a crucial role in naming and popularizing a new sexual morality that remained attuned to notions of bourgeois respectability but also challenged the reader to reassess their own sexual ethics in the face of the changing realities of modern life" (Lang and Sutton 197).

73 "Werkstatt"

74 "Mephistopheles: 'Was gibt es denn?' / Wagner: '... Es wird ein Mensch gemacht.'" Adler uses these exact quotations as well (193). It is open to discussion if, and to what extent, Mephistopheles plays a part in the creation of Homunculus.

75 "kristallisieren"

76 "Was man an der Natur Geheimnisvolles pries, / Das wagen wir verständig zu probieren, / Und was sie sonst organisieren ließ, / Das lassen wir kristallisieren."

77 "aus viel hundert Stoffen"; "eine Urzeugung nach Alchimistenart"

78 "das Palimpsest einer bestürzenden Modernität im Zeichen bio- und nano-technologischer Phantasmagorien". Osten's statement could also be applied to Goethe's *Die Wahlverwandtschaften* (*Elective Affinities*) and the siring and portrayal of the child, Otto. The name alone allows for comparisons to DNA theories, since Otto resembles and is named after his "four parents," Eduard Otto, Charlotte, Otto, and Ottilie.

79 "ein krystallklar aus dem Glas hervorgegangener Homunculus will nicht geringer erscheinen als sein natürlicher Mitmensch."

80 "Die Homunculi werden sich mehren, werden sich zusammentun, eine Vereinigung bilden, sie werden vor ihren König, ihr Parlament treten und ihre Legitimität erbitten oder sogar ertrotzen."

81 "Homumkulus; A Modern Epic in Ten Books"

82 "Sprach von Albumin sehr Vieles, / Von Fibrin, von Globulin auch, / Keratin, Mucin und Andrem, / Und von regelrechter Mischung, / Und belehrte seinen Schöpfer / Und Erzeuger gründlich, wie er's / Hätte besser machen können."

83 "[r]eduzirt' ihn auf das erste / Urprinzip vitalen Dasein, . . . Auf den embryonalen Zustand, / Auf ein rationell gemischtes, / Zartes Protoplasma-Klümpchen;" "[a]uf geheimnißvolle Weise"

84 "[a]usgereift und ausgestaltet, / Lebend und gesund, das zarte / Wunderkind, das ungezeugte."

85 The seventh part of Hamerling's text, "Die Affenschule" ("School for Apes"), narrates how Homunkulus founds a school for apes, to breed and train better humans.

86 "Er hat vorausgesehen, was kommen werde;" Steiner discussed Hamerling's "Sehergabe" ("seer gift"; 284), which, to the Austrian philosopher's amazement, foresaw battle airships, in the context of the early twentieth-century "homo oeconomus" and "Homunkulismus:" "Die Menschen können die Natur nicht seelenlos machen, die behält schon ihre Seele. Aber sich selber können sie seelenlos machen" ("Humans cannot take nature's soul away, she will keep her soul. But they can make themselves soulless"; 286-287). Steiner first discussed Hamerling's *Homunkulus* in a review in 1888, suggesting that Homunkulus's artificial creation makes him incapable of growth and characterizing the protagonist as "Repräsentant des modernen Menschen" ("representative of the modern man"; "Robert Hamerling" 146-147; the review is commonly referred to in discussions on Steiner's anti-Semitism).

87 In *De Natura Rerum* (1538), Paracelsus gives instructions for making a homunculus, which Adler refers to (194).

88 "Von jeher hat sich der Mensch bemüht, das, was ihm die Natur bietet, künstlich darzustellen."

89 Reinert also gained some success as an author. The script for *Homunculus* was his breakthrough as a scriptwriter (notably for *Nerven* (*Nerves*; 1919)).

90 In a letter to his thirteen-year-old son in 1953, Francis Crick, who, along with James Watson, first discovered the structure of DNA, describes his discovery as follows: "Now we believe that the DNA <u>is</u> a code. That is, the order of the bases (the letters) makes one gene different from another gene (just as one page of print is different from another)" (Watson et al. 262; emphasis in original). Crick then drew this "beautiful structure" by linking words such as sugar and phosphorus together via short lines (Watson et al. 258-259).

91 Collins's reference to "the language of God" is not only suggestive of scientists' own divine powers but can also be seen as a strategic means to forestall any objections based on religious grounds (I would like to thank Robin Ellis for this insightful observation). In this way, Collins responds to the origins debate by combining creationist and evolutionary models. Moreover, this introduction—and indeed common understanding of the human genome—evokes the legend of the golem: "If the life-awakening word is placed in the amulet on his chest, he will be alive as long as he wears it," Rabbi Loew learns in Paul Wegener's *Golem, wie er in die Welt kam*. Once Loew places a piece of paper with the word "aemaet," meaning "truth" and "God," into the amulet and attaches

both to the golem's chest, the being, made artificially out of clay, opens its eyes. The *Golem* explicitly points to its own cinematic construction in the sequence that portrays the court watching the history lesson given by Rabbi Loew, who created both these awe-inspiring cinematic images as well as the equally mesmerizing golem: the film provides its spectators with an audience enjoying a film.

92 These two examples also demonstrate that the textual features of DNA codes, to echo Collins, go beyond metaphoric characteristics.

93 Cf. Ma et al. The authors also compare their own experiments and results with studies on monkeys and other animals (cf. 6). Ultimately, they hope their technique can become a part of preimplantation genetic diagnosis (PGD), which is increasingly offered in IVF treatment. While this technique is designed to avoid diseases, the authors point out that "supplementary exposure of human gametes or embryos to small molecules and/or inhibitors may adversely affect embryonic development" (6); further testing is needed.

94 The *New York Post*'s article on the scientific breakthrough was entitled "Babe New World," featuring the image of a baby behind a giant double helix, and asking "is this a first step to customizing babies?" (Li and Fears 5). The headline, as well as the entire discussion, evokes responses to the birth of Louise Joy Brown. Pruden provides a good overview of the ongoing debate, from a Canadian perspective.

95 Cf. Introduction.

96 "Wie wird ein künstlicher Mensch hergestellt? Ein Problem, dessen Lösung die Gelehrten schon seit langem beschäftigt. Man will die Frucht der Liebe durch ein chemisch-physikalisches Surrogat ersetzen. In der jetzigen Epoche der Hilfsmittel und des Menschenmangels taucht die Frage von neuem auf, und was Altmeister Goethe im "Faust" als Homunculus ersann, soll nun Wirklichkeit werden – im Film. Da kann der kühnste Gedanke in die Tat umgesetzt werden, "Homunculus" wird Gestalt erhalten, wenn auch keine greifbare, aber eine sichtbare, erklärliche, verständliche."

97 I encountered the following reactions first on a handout in an introductory film class taught by Linda Williams at Berkeley.

98 Cf. Kaes et al.: Ewers 14; Brod 16; Melcher 20; Arndt 34; Lang 142; Siemsen 296; Lukács 379; J.B. 424; Mierendorff 426; Kracauer 466; Arnheim 570.

99 Discussions surrounding these issues continue to be led vigorously (cf. Goetz and Taliaferro for overview).

100 It is interesting that the authors use their own creation in the making—the writing of a historical overview of discourses about the soul—as an example. It points to the animation of text via physical and mental labour, and thus also links these entities irrevocably together.

101 Daniel Dennett's research provides another helpful angle on these connections. In an interview with the *New Yorker*, he explains his concept for the layperson as a "'sort of'" approach: "He [Dennett] regards the zombie problem as a typically philosophical waste of time. The problem presupposes that consciousness is like a light switch: either an animal has a self or it doesn't. But Dennett thinks these things are like evolution, essentially gradualist, without hard borders. The obvious answer to the question of whether animals have selves is that they sort of have them. He loves the phrase 'sort of.' Picture the brain, he often says, as a collection of subsystems that 'sort of' know, think, decide, and feel. These layers build up, incrementally, to the real thing. Animals have fewer mental layers than people—in particular, they lack language, which Dennett believes endows human mental life with its complexity and texture—but this doesn't make them zombies. It just means that they 'sort of' have consciousness, as measured by human standards" (Rothman). The notion that artificial beings might be "sort of" human is arguably explored by *Homunculus* and *Alraune* but also texts such as Adler's. Indeed, this appears to be the crux of the problem as it undermines thinking in distinct categories and challenges notions of identity (cf. also Mitchell).

102 Ivanoff's pictures of horses evoke Leland Stanford's and Eadweard Muybridge's experiments with horses in the 1870s and early 1880s. By taking photos of them at several intervals at a farm in California, they proved that the animals lift up all of their four legs simultaneously while fast trotting, a peculiarity that is not visible to the naked eye. It is noteworthy that Stanford's and Muybridge's scientific experiment with the gait of a horse and the zoopraxiscope was a crucial step towards the invention of the cinema. The zoopraxiscope, an early image projector developed by Muybridge, allowed for the convincing reproduction of horses' movements. Muybridge's projections of running horses proved so lifelike that they caused a dog to bark at them (cf. Williams 37-38; Solnit).

103 Voronoff also used before-and-after pictures of his human clients.

104 Oswald thus follows Ewers's book ending. Cf. also Hans for a comparative analysis of the two different endings in the context of the evolution of film.

# Chapter Two

## Cultures of Circulation: Identity and Memory Politics in Frank Schätzing's *Der Schwarm* (2004)

### Introduction

On September 26, 2005, the social marketing campaign "Du bist Deutschland" set out to ignite a positive, optimistic, and resourceful sense of national identity in its German audience.[1] The accompanying television spot began with showing green, lush meadows; large, grown trees; and the sun hanging low in the blue, cloudless sky over a beautiful, peaceful landscape. The final words of this two-minute clip, which starred celebrities and non-famous citizens alternately reciting the campaign's manifesto, were "You are the tree" and "You are Germany."[2] The declaration also featured statements such as "A butterfly can cause a typhoon;" "You are a part of everything;" "And everything is a part of you;" or "You are the hand. You are 82 Million."[3] The campaign thus envisioned a national, energetic, and self-reliant collective made up of individual, yet connected, physical elements. Images of trees and nature; depictions of people's faces and their places of work; visions of the country as a typhoon and a giant hand; as well as the prominently featured Memorial to the Murdered Jews of Europe point to the genealogical, historical, bodily, and eco-systemic tenets of the concept of collective nationhood this campaign imagined across various media outlets.[4]

The campaign "Du bist Deutschland" demonstrates that the notion of collectives that are intrinsically connected by the same nationality, a shared past, and a mutual mindset continues to hold appeal for certain segments of multicultural, networked German society in the globalized twenty-first century. The campaign also shows how its creators rely on and make use of primarily visual media to construct and distribute a unified portrayal of a German national collective. By creating such mediated, visual constructions, organisers, in fact, create *Menschenbildung* in the form of national collectivity. We see this persistent, even resurgent, idea of nationalism, I argue, also play out in Frank Schätzing's 2004 fictional eco-thriller *Der Schwarm*.[5] The science-fiction novel's premise is that "[t]he sea fights back" ("Der Schwarm").[6] In *Der Schwarm*, people all over the world face curious attacks by a variety of sea creatures: whales ram boats full of tourists near the Canadian west coast, clams sink ships in international waters, jellyfish flood coastal areas across the world, and deep-sea worms cause a deadly tsunami in Northern Europe. These life-threatening behaviours baffle scientists across the globe, who eventually discover that these attacks are orchestrated by the yrr, single-cell, highly intelligent, technologized, swarming organisms living in the deep ocean. While *Der Schwarm* warns against environmental degradation by painting an apocalyptic picture of a world in which humans' existence is threatened by their disregard for nature, I argue that the novel's exploration of environmental pollution, in fact, articulates and negotiates anxieties about German national and ethnic identity based on collective and cultural memory in circulatory environments. I demonstrate that the novel's environmental focus serves as means to construct a natural, "biodeutsch" identity, which also originates in genetic and genealogical forms of cultural memory.[7] These widespread fears about the German *state*—denoting here "condition," "form," and "realm"—are transmitted via an alien race and its

technological and physical superiority, as well as characterizations and plotlines based on anti-American, anti-Semitic, and philo-American-Indian clichés. In a nutshell, *Der Schwarm* shows, I argue, that circulatory, global phenomena emerge as a formidable threat to the continuance of ethnic, national, and cultural collectives. Hence, patterns of circulation put the reproduction of a German *state* at risk, and *Menschenbildung* is here contingent upon ethnicity, nationhood, and collective and cultural memory.

The following discussion first highlights the connection between environmental terminology and globalization. It foregrounds circulatory phenomena and metaphors as a framework for analyzing *Der Schwarm*. These particular correlations and symbols depict the novel's yrr as a "culture of circulation," a concept that is personified in their swarm-like and technologically advanced appearance. The discussion later in the chapter centers on Schätzing's engagement with anti-American and anti-Semitic stereotypes to project the image of a dystopian global society, while the portrayal of Inuit culture serves as a model for an ideal collective situated in larger, natural networks. Taken together, these diverse themes, as argued in the final part of this chapter, demonstrate how *Der Schwarm* negotiates *Menschenbildung* through its identity and memory politics and by envisioning a German *state* under siege.

## Metaphors of Global Flows in the Age of Circulation

In her analysis of *Der Schwarm*, Eva Horn notes that Schätzing's novel stands out for the global scope of its narrative, and that the yrr distinguish themselves from other fictional depictions of swarms because of their "global intelligence" and actions ("Leben ein Schwarm" 120; cf. 120–123).[8] Schätzing's distinct portrayal of global relations warrants a closer look because *Der Schwarm* envisions global scenarios to ultimately caution against such developments. The novel utilizes metaphors characteristic of globalized, circulatory phenomena, such as environmental scenarios, swarms, and networks to envision ethnic and national *Menschenbildung* as a response to globalization.

In its simplest definition, the term "circulation", according to the Oxford English Dictionary (OED), describes "[m]ovement in a circle, circular motion or course" ("circulation"). Two other, more specific explanations given by the OED are noteworthy for the purpose of the following discussion: "circulation" describes not only "[t]he transmission or passage of anything" but also "[t]he circuit of the blood from the heart through the arteries and veins, and back to the heart. Hence, of any nutritive fluid through the vessels of animals or plants" ("circulation"). Therefore, circulatory patterns, like reproductive ones, denote and bring together biological and cultural phenomena. The term's diverse biological and cultural meanings converge, as the following analysis further demonstrates, in the yrr and their swarming behaviour: their idiosyncratic composition is both natural and technological.

Arguably, circulatory phenomena are shaping people's experiences more intensely than ever before. Schätzing's novel thus reacts to a myriad of cultural developments characteristic of the time of its creation. "In the globally integrated and interconnected world of the 21st century, the notion of circulation—of goods and services, ideas and images, people and pandemics–takes on unprecedented significance," Melissa Aronczyk and Ailsa Craig explain (94). They point out that, "[a]s we move from 'the wealth of nations' to the 'wealth of networks,' … far less attention has been paid to the dynamics of circulation itself as a driving force of global change" (94).

Aronczyk's and Craig's discussion is a response to Benjamin Lee's and Edward LiPuma's earlier arguments on the concept of circulation. In "Cultures of Circulation: The Imaginations of Modernity," Lee and LiPuma propose that we "rethink circulation as a cultural phenomenon" by examining the performative agency of modern circulatory processes in the context of globalization. Circulation is here seen as a cultural force that actively shapes, for example, social surroundings and, therefore, identities. This definition also describes the circulatory patterns pervading *Der Schwarm*, and, especially, the impact the fictional yrr exert in the novel. "[C]irculation is a cultural process with its own forms of abstraction, evaluation, and constraint, which are created by the interactions between specific types of circulating forms and the interpretive communities built around them," Lee and LiPuma claim. "It is in these structured circulations that we identify cultures of circulation" (192). If, as Lee and LiPuma argue, contemporary circulation processes have initiated an "entirely new" (210) era, what is imagined anew? What additional meaning is created within and through cultures of circulation? What anxieties are evoked, what is included, what is excluded? What metaphors negotiate circulatory processes and their specific imaginaries? Schätzing's novel provides some answers to these questions via environmental pollution of the ocean; a maritime, alien life-form; and an international response team of experts.

"Cultures of circulation" emerge in environments characterized by processes of globalization. Alluding to globalization's own circulatory presence, Sarah Franklin et al. state that "[g]lobalisation has become one of the most widely used terms of the last decade" (1). Anthony Giddens's understanding of globalization as "an intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa" (64) paraphrases the relationship between human-caused environmental pollution and the yrr attacks, conducted in response to humans' disregard of nature and as an act of revenge, across the globe. The novel's human protagonists experience theses processes of global interconnectedness as fast, uncontrollable, and universal developments. Global relations, moreover, have led to the breaking down of borders and a decreasing significance of the nation state. The novel reflects on these processes via the literal absence of governing institutions and the formation of an international taskforce made up of scientists, politicians, journalists, and intelligence and military experts, heroes who ultimately save Schätzing's fictional world from global catastrophe.[9] These last two aspects of global processes and their cultural consequences are furthermore addressed in the portrayal of circulation as a phenomenon that explicitly comes to life in the nationless, amorphic yrr.

The widespread use of terminology relating to "flow(s)" in discussions on globalization and its effects provides a first starting point in exploring questions arising from Lee's and LiPuma's arguments on circulatory cultures, and understanding the yrr as an embodiment of such global trends. "I propose that an elementary framework for exploring such disjunctures[10] is to look at the relationship between five dimensions of *global cultural flow* which can be termed: (a) ethnoscapes; (b) mediascapes; (c) technoscapes; (d) finanscapes; and (e) ideoscapes," Arjun Appadurai writes when outlining his influential theoretical model on globalized traffic of people, media and images, technology, capital, and ideologies (296; my emphasis). Appadurai's conceptualization of a globalized world as "-scapes" firmly situates global cultural flows within a spatially—indeed, an environmentally and close to nature—explanatory model. In botany, the word, after all, refers to "[a] long flower-stalk rising directly from the root or rhizome" ("scape, n.2."). Appadurai's description of global transformations in terms of cultural landscapes moreover points to his theory's aesthetic and visual qualities: globalization and its currents become imaginable and are imagined as natural flows. Ten years after Appadurai, Anna Tsing begins her

thoughts on "The Global Situation" as follows: "Click on worldmaking.interconnections. Your screen fills with global flows" (327). Notably, Tsing continues her exploration of the changed landscape of a global world by evoking next a creek flowing through an idyllic countryside, "mak[ing] and remak[ing] its channels" (327). In Tsing's examination, the digital networking processes of global flows meet their natural equivalents.

Global processes and their effects thus invite environmental, circulatory comparisons, often evoking images of earth and water. The oceanic environment that Schätzing envisions in his eco-thriller therefore lends itself to explore natural as well as global connections. The novel's depiction of global, circulatory phenomena and of its equally factual as well as fictional maritime eco-system can thus be understood in terms of an "oceanscape." Oceanic metaphors have moreover been used to capture the effects of globalization in definitions of culture. Accounting for the changing parameters of national cultures caught up in globalization, Tony Fang, for instance, understands "culture as having a life of its own" (81). In explanation of his "'ocean' metaphor of culture," Fang writes: "The ocean has no boundaries, and its various waters are both separate and shared, both different and similar, and both independent and dependent" (88). Fang's comparison between the ocean and culture in a globalized setting effectively describes the yrr's own versatile nature. Both Fang's oceanic model as well as the particular constitution of the yrr allude to cultural anxieties caused by global, circulatory phenomena: they evoke terror because they stand in the way of clear and unambiguous affiliations.

While it might appear contradictory at first that similar language and metaphors describe the distinct concepts of globalization, circulation, and culture, the use of the same vocabulary stresses the circulatory connections between these concepts and highlights their influences on each other. Globalization is about existing and emerging relations, always negotiating change and stability simultaneously. Natural descriptions demonstrate how globalized processes carve new channels in familiar terrain. Tsing calls these processes of globalization "friction": "Cultures are continually co-produced in the interactions I call 'friction': the awkward, unequal, unstable, and creative qualities of interconnection across difference" (4). These "frictions" are, in fact, at the core of Schätzing's eco-thriller, which analyzes the converging and interaction between global flows in terms of an apocalyptic, environmental catastrophe. This negotiation is personified in the yrr: as a maritime swarm living in the "oceanscape," the yrr, like "[t]he blue planet, the foetus and the cell," negotiate "*the changing facts of life in a global context*" during the era of circulation (Franklin et al. 12).[11]

## Swarming Collectives: The Yrr as a Culture of Circulation

Schätzing's *Der Schwarm* therefore responds to global flows by sketching a connected universe and alien protagonist, both of which are the epitome of environmental, circulatory patterns. In the novel, these patterns find expression in the portrayal of the yrr as swarming beings and their genetically novel reproductive cycle. Swarms, as both biological as well as technological entities, appear to aptly capture social and cultural ways of organising and have thus emerged as common descriptions of globalized and circulatory processes.[12] Within the fictional world of Schätzing's *Der Schwarm*, the alien yrr, as a metaphor of an oceanic life-form and globalized circulation, exist and act globally. They initially represent the human protagonists' enemy that needs to be defeated in order for the world to survive. As a biological collective, the yrr—whose

name, according to the novel, resulted from playful typing on the computer, and is evocative of the DNA code—come into being in terms of difference: they are what humans are not. They are made up of jelly-like matter, have no distinct physical shape, and are sexless. They possess cognitive abilities, yet their intelligence does not correspond to human intellect or morality. Although the yrr are single-cell organisms, they exist in cellular collectives and communicate via pheromones. They are legion, they aggregate, they shapeshift, and they swarm.

Those characteristics and behaviours that define the yrr as a maritime swarm cause anxiety among the protagonists—and account for the story's suspense. The following section will engage with theoretical considerations on the meaning of swarms to demonstrate how the yrr serve as an illustration of an optimal biological and cultural life-form under circulatory, global conditions. As such a *culture of circulation*, they personify human fears about exactly those types of environments. Anxieties arise particularly in connection with questions surrounding the social organisation of groups, as global and circulatory patterns (re)define notions of connectivity and collectivity. The yrr, by contrast, show quite plainly what humans lack in order to strive in globalized settings. The novel ultimately sends the message that globalization and circulation affect national collectives adversely.

Schätzing's depiction of the yrr as a culture of circulation in the visible form of a swarm corresponds with basic definitions of the latter term. In accordance with the OED, the yrr are essentially a "cluster of free swimming cells"—"unicellular organisms moving in company" ("swarm, n."). The yrr cell clusters initially appear as biological traces, namely blue, jelly-like residue. Like a swarm of bees, as defined by the OED, the yrr "gather in a compact mass or cluster … under the guidance of a queen" ("swarm, n."). When Karen Weaver, a journalist for science magazines, descends into the depths of the ocean in a final, rather aesthetic, showdown at the end of the book, the yrr ultimately come into clear focus in a "strange, yet sublime display" (862):

> Weaver watches, and needs no further proof that she is seeing highly developed, unmistakably non-human intelligence. Her gaze wanders up the blue dome, climbing until she sees its apex, from which something is descending, the source of the tentacles, which hang down from beneath.[13] It is almost perfectly round and big like the moon. Grey shadows flit beneath its white surface, casting complex patterns that vanish in a trice, shades of white upon white, symmetrical configurations of light, flashing combinations of lines and dots, a cryptic code—a semiotician's feast. To Weaver's eyes it looks like a living computer, whose innards and surface are processing calculations of staggering complexity. She watches as the being thinks. Then it occurs to her that it's thinking for everything around it, for the enormous mass of jelly, for the whole blue firmament, and finally she realizes what it is. She has found the queen. (862)

At first glance, Weaver focuses on the yrr's biological, natural features: the emerging tentacle points to their hybrid—animal-human-like—nature, while the comparison to the moon stresses their central, even supervisory, function in the novel's larger eco-system. The yrr's special networking abilities are already inherent in these natural comparisons but they are explicitly rendered visible via a description of their mathematical, technologized intelligence in action. As a swarming "living computer," the yrr thus personify anxieties about such networking processes, and their visualization—the yrr's "thinking"—implies concerns about the swiftness and instant availability of information as well as about networking and technology in general.

These fears become rather evident when comparing the yrr to artificial intelligence computer systems (AI), such as IBM's (International Business Machines Corporation) Watson. Watson is best-known for winning against human contestants on *Jeopardy!*. In fact, Watson and the yrr share history: the AI system was conceptualized in 2004—the year Schätzing's thriller was also published—in response to Ken Jennings's winning streak on the popular American game show. To compete against Jennings, Watson required a vast, prompt memory as well as the ability to understand and produce natural language. Eventually, Watson excelled at both.[14] The novel features a similar scenario: the international team of researchers mandated with the task of analyzing and eliminating the threat the yrr pose work frantically on creating a mathematical, biological language.[15] The successful invention of a pheromone-based language ultimately facilitates communication with the alien maritime species, creatures that, like Watson, stand out for a superior memory.

While the technological appearance and intellect of the yrr visualizes their particular abilities, these characteristics also point to concerns about digital networking and processing technology. A case in point that perfectly illustrates the fears the yrr embody is German Chancellor Angela Merkel's denoting of the Internet as "Neuland," "virgin territory," in response to the global surveillance disclosures published by whistleblower Edward Snowden. Snowden's release of secret documents uncovered the vast extent to which the National Security Agency (NSA) and the Five Eyes intelligence alliance (FVEY)[16] had operated several clandestine, large-scale mass surveillance programs to monitor communication between its own citizens as well as those of allies, collected such data without legal authority, and shared sensitive information among each other. During a press conference with U.S. President Barack Obama on June 19, 2013, in Berlin, Merkel then stated: "The Internet is, for all of us, virgin territory. And it naturally allows enemies and opponents of our democratic order to threaten our way of life with entirely new methods and entirely new strategies."[17] Snowden's revelations caused an international uproar, were met with outrage from the majority of German commentators and politicians, and put a strain on U.S.-German relations.[18] In its aftermath, one debate centered on the possibility of escaping American influence by establishing "Schlandnet," a German Internet.[19]

Merkel's portrayal of the web as a recently discovered novelty resulted in immediate ridicule by German social media users, who vigorously mocked her and the German government for their apparent ignorance about the existence of the decades-old Internet. Irrespective of how far out of touch German government officials and their policies are with the realities of information technology, Merkel's choice of words—"Neuland"—is noteworthy, and, arguably, no coincidence. "Neuland," as the *Duden* defines the term, means "1) newly obtained land for the purpose of settlement or economic development," and "2a) (rarer) new, previously unknown, unexplored land, territory" or "2b) new [until now] area which has not yet provided experiences, insights" ("Neuland" *Duden*).[20] As the *Digitale Wörterbuch der deutschen Sprache* (DWDS) shows, Merkel's particular application of the word, though ridiculed, has resulted in an increased use of "Neuland" as an alternative denotation for "Internet." Both the term's traditional meaning and newly coined usage reveal the role that spatial and physical imagination play in conceptualizing digital technology, and, moreover, point to anxieties about nation states' limited influence and diminishing relevance in a globally connected world. The idea of "Schlandnet" further substantiates the desire for restrictions on the Internet's globality and, in fact, for a renationalization of global, connected spaces, relations, and technology. This incident, in other words, demonstrates how digital connectedness and global networks are associated with concerns about foreign—particularly American—surveillance; hostile and sophisticated tactics and

weapons; and the desire to nationalize the world wide web and information technology. These anxieties are already aptly captured by the yrr and Schätzing's "oceanscape."

These cultural concerns become, moreover, quite visible in the yrr's appearance, which calls to mind both Watson and the Five Eyes alliance. On *Jeopardy!*, Watson appeared as an animated, bluish-greenish globe with five antennas on top. Its stick-figure-like avatar carried human traits, personified digital networking, and imagined a globally connected, ecologically aware planet.[21] Watson's "thinking," like the yrr's, was rendered via a change of colours, from blue to green to purple, flickering fast in circles across his round shaped body.

Watson's avatar thus resembles the book cover of the first German edition of *Der Schwarm*, and, therefore, the first visual rendition of the yrr. The cover features a black background with a thick blue circle in the middle, with white striations crisscrossing through the blue ring and gradually fading towards the inside. The yrr appear thus as a large digital- and biological-looking blue iris.[22] Both Watson's avatar and the yrr's image point to a common aesthetic when creating artificial life and, respectively, imagining high-tech life-forms: the images capture and make visible both technological and natural traits.

This visualization of the yrr as an essentially biological and digitally processing iris evokes the organisation of the Five Eyes alliance but it moreover resonates with scientist Nigel R. Franks's hypothetical thoughts on swarm behaviour in army ants.

> In my wildest dreams, I imagine that the whole swarm behaves like a huge compound eye, with each of the ants in the raid front contributing two lenses to a 10- or 20-m-wide "eye" with hundreds of thousands of facets. Each ant has possibly only the slightest directional preference, but through tactile signals and trail pheromones these preferences might be collated and amplified across the swarm. In this way the army ants could comprise a parallel-processing computer of intriguing yet awesome simplicity. (144)

Franks's description proves helpful in contextualizing Schätzing's yrr cover and depictions of swarms in the novel: "The shoal was motionless," the yrr's first human victim realizes when encountering a swarm of sea bass. "A wall of indifference stared back at him through bulbous eyes. It was as though he'd conjured them out of nowhere. As though they'd been waiting for him," Juan Narciso Ucañan, a poor fisher in Peru, thinks before the swarm of dorado kills him (13). Since the fish are connected to and controlled by the yrr, Ucañan arguably looks at the swarm's "huge compound eye."[23] Swarms' eyes thus encapsulate their twofold ability to be simultaneously viewed as both a technological as well as biological entity. What is essentially an abstract biological and digital blue iris embodies the inner life of complex machines, Internet connectivity, and surveillance technology; the iris nevertheless gives the yrr an organic, alive, and tangible presence; and visualizes their omnipotent, omniscient essence. As such, the yrr personify a corporeal, organic, and technologically highly developed form of circulation that causes anxiety because of its all-encompassing knowledge, instantaneous otherness, and physical presence.

Franks's and Schätzing's conceptualizations thus provide one explanation for the popularity of swarms these days. The connections between digital processing and networking technology and swarms, between computers and the yrr, between the technological and biological, mirror a broader trend emerging primarily during the last few decades: "Swarms are all the rage," Horn notes five years after Schätzing's novel hit bookstores ("Schwärme" 7).[24] Swarms are indeed a popular subject matter, particularly when it comes to describing social media phenomena,

networking technology, and their influence on a variety of contemporary incidents and developments. Prominent examples of swarming phenomena are the anti-globalization protests at the gathering of the World Trade Organisation (WTO) in Seattle in 1999, the 2001 creation of Wikipedia, or the 2002 outbreak of severe acute respiratory syndrome (SARS). The swine flu pandemic in 2009 and the 2010 Arab Spring protests, as well as attacks by Islamist terrorists and LOCUST, low-cost UAV swarming technology, are more recent, commonly referred-to examples of swarming. Already in the 1990s swarm intelligence took roots as a field of research, while scholars in other disciplines also zoomed in on swarms and their cultural functions. Sean J. A. Edwards's 2005 definition of military swarming as "occur[ring] when several units conduct a convergent attack on a target from multiple axes" (2) aptly describes groups of swarming viral nano-machines conducting coordinated attacks in Michael Crichton's 2002 novel *Prey*.[25] Earlier literary and cinematic treatments of swarms—and perhaps the best-known examples—are Stanisław Lem's 1964 novel *The Invincible* and Alfred Hitchcock's 1963 thriller *The Birds*.[26] These diverse incidents, critical analyses, and fictional scenarios demonstrate how swarms and swarming are biological and technological, political and social phenomena.[27] These different cultural and scientific characteristics of swarms and swarming also converge in Schätzing's yrr and are visually bundled in the yrr's appearance as an "eye."

The circumstance that the yrr visually resemble digital networking processes, however, is not only linked to concerns about technological developments but also to anxieties about cultural and social connectivity and collectivity. These latter fears find particularly expression in the yrr's existence as a swarm. How are they—and, by implication, national and ethnic groups—connected? What precisely makes them a collective? And what exactly ensures this state in the long term? Swarms, for instance, distinguish themselves from other forms of groups in the way they are organized. Eugene Thacker's 2004 critical, fundamental analysis of "Networks, Swarms, Multitudes" provides a first, productive interlocutor to further trace the ways the swarming yrr model connectivity and collectivity in a way that reflects on the novel's overall engagement with identity and memory politics.[28] "Networks, then, are those forms of distributed organization that facilitate connectivity (qualified by pattern)," Thacker explains. "Similarly, swarms are those forms of distributed organization that facilitate collectivity (qualified by purpose). … [N]etworks can form a collectivity, through connectivity, while swarms can initiate a connectivity, but only through collectivity" ("Networks Part Two"). In *Der Schwarm*, the yrr first come into focus as a pattern of coordinated, global attacks, and as blue cellular traces at the sites of these unusual occurrences. Like the swarms in Crichton's *Prey* and Edwards's analysis, the yrr, facing the threat of extinction, become politically and militarily active out of self-defence by swarming simultaneously in a deadly manner at locations across the globe. In other words, the yrr's ability to connect to and turn into other maritime animals and build a network of effective combat units across time and space turns them into an invincible enemy with a sole purpose. However, while the yrr initially appear as a powerful network that is itself intrinsically linked to the entire eco-system, the international taskforce soon discovers that these irregularities in animal behaviour and loss of human lives are ultimately happening because of the yrr's existence as a swarming collective—the primary source of the fear they evoke.

Here, collective interconnectedness in networking and swarming emerges as a twofold threat to humans. "In swarms there is no central command, no unit or agent which is able to survey, oversee and control the entire swarm," Thacker argues, zooming in on the particular factor that turns questions of connectivity and collectivity into anxiety-inducing issues. "Yet the actions of the swarm are directed, the movement motivated, and the pattern has a purpose. This is the paradox

of swarms" ("Networks Part Two"). This particular trait manifests itself nowadays as the most notable and fascinating characteristic associated with swarms. Likewise, Horn and Lucas Marco Gisi emphasize the lack of central control in swarms, a characteristic that both appeals and disturbs. Swarms are "collectives without a center," they argue eloquently.[29] This idea is indeed reflected in many descriptions of swarming throughout much of Schätzing's eco-thriller: "Gathered just beneath the surface of the water was a shoal of shimmering fish, each as long as his arm, stretching as far as he could see," the narrator says, describing Ucañan's witnessing of the fish swarm at the very beginning of the novel. "Then, as a unit, the shoal changed course by a few degrees. The gaps between the bodies closed. … There were too many of them. … A shoal of that size was unreal. It filled his view. … Terror swept through him. His heart was racing" (12–13). The moment when distinct components vanish from view and appear again as an apparently single mass or cluster, the swarming collective elicits a fearful physiological reaction.[30] The Peruvian fisher is therefore overcome by feelings of horror when he finds himself suddenly unable to identify individual fish—a center. Ucañan's dread intensifies when he is unable to control or even communicate with the swarm of sea bass; his inability to connect to the swarm—with even one single dorade—ultimately results in his drowning.

Thacker's explanation of the "paradox of swarms" puts a label on the initial terror the yrr and their swarming tactics evoke: their form of collectivity—being one but many—is a cause for concern. The yrr demonstrate how swarms are a self-organizing "collectivity that is defined by relationality"—"a dynamic and highly differentiated collectivity of interacting agents" ("Networks Part Two"). Collectivity, Thacker explicates, should not be confused with connectivity, as they are not interchangeable concepts (cf. "Networks Part One"). Collectives, Thacker explains, need to be connected before becoming collectives, yet things can be connected without being or becoming a collective—a circumstance that marks the fundamental difference between Thacker's definition of networks and swarms (cf. "Networks Part Two"). In *Der Schwarm*, these different types of relationality are juxtaposed via the yrr and the international taskforce; the latter essentially functions as a stand-in for a (human) multicultural society. The collectivity of the swarming yrr is, as the novel posits, a genetically inherited collectivity: it thus ensures the yrr's collective kinship across time and space, as well as under changing circumstances.

In other words, *Der Schwarm*, like Thacker, asks: "are we connected because we are collective, or are we collective because we are connected?" ("Networks Part One"). In the end, Schätzing's novel also comes to a similar conclusion as Thacker: connectedness does not automatically translate into collectiveness. The way Schätzing conceptualized the yrr they embody both network and swarm dynamics. As a network, they are linked to the natural, oceanic world and its inhabitants; the latter serve the yrr as swarming weapons to restore nature's ecological balance. A collapse of the maritime sphere, the novel suggests, would result in the breakdown of the entire global ecosystem, and thus the yrr's own destruction. To prevent these scenarios, the yrr take action as a collective. By showing quite plainly the shortcomings of the human protagonists, the yrr evolve as an alternative way of life in the novel.[31] In comparison to the yrr then, human protagonists have to learn and re-learn not only how to have a relationship with nature but also with their ethnic and national heritage. The novel's concerns about the human protagonists' detachment from the environment—which, after all, almost results in the annihilation of humankind—signify, in fact, anxieties about a neglected bond with a collective ethnic and cultural ancestry. The taskforce, which is founded to provide an explanation for the numerous mysterious maritime incidents, then serves as a means to explore connectivity and collectivity among human groups. As the following sections discuss further, this social, professional group of experts

ultimately fails to function as a collective, since the novel defines collectivity as a biological category. The novel mainly traces these questions of connectivity and collectivity within the taskforce among cultural and ethnic lines, namely in terms of anti-American, anti-Semitic, and philo-American-Indian stereotyping. The question of how collectives are formed, and remain collective in the age of circulation, however, is, the crux of the matter when imagining national and ethnic communities in a globally connected world.

Echoing other studies in the field of swarm theory, Thacker's "paradox" highlights the absence of a central authority as a key characteristic in swarms. This lack of control in view of homogeneous collectivity accounts for much of the fascination that swarms exert on their audience. Schätzing's depiction of the yrr, however, suggests that the relationality between connectivity, collectivity, and swarms is more complicated than leading theoretical models indicate. After all, the final, decisive encounter between Weaver and the yrr, which Gabriele Dürbeck describes as a "mythical reunion" ("Popular Science" 25),[32] stresses the pivotal function the swarm's queen plays in this last attempt to negotiate a peaceful coexistence between humans and the yrr. "The queen makes contact" (862). Indeed, the active, crucial role of the yrr queen in *Der Schwarm* runs counter to the notion that swarms have no explicit, central authority that controls their behaviour.

The appearance of the yrr queen thus re-individualizes the swarm, a process that is also an aesthetic, even spiritual event. The existence of a center capable of "thinking" and acting not only allows for a diplomatic exchange leading to a fragile, nonetheless effective truce, but it also eliminates much of the horror swarms traditionally—and the yrr initially—cause. The presence of a queen, moreover, shifts social and political connotations ascribed to swarms and, therefore, the yrr. Hence, Schätzing's conceptualization of the yrr points to Eva Johach's important reminder that, technically speaking, not all swarms are centerless collectives. Without a queen, there is no viable, functional bee swarm. Johach therefore argues in favour of differentiating "two types of swarm logics:"

> In the first form, the swarm follows a fundamental cyclical logic. The swarm is integrated in an overriding social structure, which is solely oriented toward reproduction and, thus, resembles an organism. In the second form, the swarm describes a model of spontaneous organisation, which is not dependent on a center in control but rather *emerges* from bare interaction. (220)[33]

In Schätzing's yrr, these genealogies coalesce, echoing the species' twofold portrayal as network and collective, as well as computer and creature. The fact that the yrr conform to both of these lineages of swarm logic reinforces exactly those characteristics that signal their superior, ideal existence as a culture of circulation, namely their collective—biological and cultural—entity.

Johach's compelling analysis of bee swarms then helps in pinpointing the main cultural anxieties the yrr embody. She demonstrates how the queen's sole "raison d'être" is the reproduction of the collective (210).[34] Furthermore, "[i]n the case of the bee queen, her biological function (reproduction) coincides with her political[35] function (representation)" (211).[36] In other words, the queen unites her social functions—namely the integration of all elements into a collective—with her biological ones—namely the reproduction of the collective—in her physical presence. She ensures the swarm's survival as a homogeneous biological as well as cultural unit: the collective thus keeps its identity while nonetheless being able to adapt. "[T]here has to be some

kind of queen-yrr. No doubt the collective is highly intelligent, but I reckon the stuff we've got down there is only the executive part of the whole,'" biologist Mick Rubin, a member of the international taskforce, explains to his American superiors. "'A bit like ants. The queen-ant is an ant, but a special one. She's at the heart of everything. The yrr are swarming organisms, you see – collectives of amoebas. … something must be guiding them'" (732).[37] Although the yrr are specifically compared to ants, Johach's observations on bee colonies as collectives with a center, and their reproductive and representative functions still apply to Schätzing's yrr. By comparing the yrr swarm to ants, and emphasizing the significance of yrr queens, the novel stresses the yrr's outstanding reproductive capabilities. Those include single-cell, asexual reproduction as well as the propagation of knowledge via their unusual DNA. Hence, the yrr are reproduction per se.[38] Thus, they constitute a superior and desirable form of biological as well as cultural collective existence.

The circumstance that the yrr are nonetheless an emergent entity further emphasizes their reproductive powers. Horn, based on Jeffrey Goldstein's thoughts on the concept of emergence, describes swarms—and as a case in point the yrr—as "emergent" phenomena: they are in their appearance "radically new," yet materialize as "integrated whole" ("Leben ein Schwarm," 104).[39] Furthermore, they are "dynamic and evolve in time," and represent themselves as "a new and different materialization of the [existing] system" (Horn "Leben ein Schwarm," 104).[40] Swarms, as the materialization of emergence, show that "*life itself is irreducibly emergent*" (Horn "Leben ein Schwarm," 105).[41] Since life is inherently emergent, human life is, in fact, also emergent. While humans are active, influential participants in this progression, they lack the ability to fully grasp such processes and their fundamental, inner workings (Horn "Leben ein Schwarm," 116). In *Der Schwarm*, this human ignorance is best expressed in the protagonists' original disregard of the environment, and their inability to see themselves as a major element of the ecosystem. As emergent, yet centered phenomena, the yrr, who self-reproduce consistently in changing, circulatory environments, remind their human counterparts of the fleetingness of connectivity and collectivity, and, thus, of their own mortality.[42]

Schätzing's yrr can indeed be imagined as an emergent collective with a center because of the swarm's particular DNA. "[T]heir DNA stores knowledge,"[43] the taskforce concludes (755). "The yrr remember everything. The yrr *are* memory" (851). In other words, the yrr inherit memory genealogically and biologically.[44] "One cell absorbs information, then divides into two—it duplicates its genome, complete with all the information stored on it," Sigur Johanson, marine biologist and professor at the Norwegian University of Science and Technology (NTNU), explains to Judith Li, in charge of the US Navy. "New cells don't inherit abstract knowledge—they get real experience, as though they'd been there themselves. Ever since the very first yrr came into being, they've had collective memory" (755). The yrr's ability to remember genetically enables them to remember collectively, which allows them to pass on their distinct biological and cultural identity across time and space.

The yrr are thus superior because they possess the ability to network and swarm; to function as a collective with and without a center; and to self-reproduce as an emergent, living, and omniscient collective across time and space. Biological, moreover asexual, reproduction of species and culture appears here as by far the most advantageous evolutionary strategy. In her comparative analysis of swarm narratives, Horn demonstrates that swarms are "in modern fiction a threat and something entirely else than human, a 'Ungestalt' – and nonetheless a foundation of human existence" ("Leben ein Schwarm," 102).[45] She argues that the trend to depict the enemy as swarm

is a development of modernity (Horn "Ungestalt des Feindes," 657). This modern turn toward swarms as a threat not only gives a fixed expression to animosity, it also reflects on collectivization and socialization and their regulating mechanisms (cf. Horn "Ungestalt des Feindes," 657). The yrr, personifying the ideal symbiosis of biology and culture, technology and nature, individualism and collectivity, and evolution and stability, emerge, in summary, as a phenomenon that negotiates the modern—circulatory and global—"changing facts of life": they are a cultural and biological *culture of circulation*.

As a culture of circulation, I argue, however, that Schätzing's *Der Schwarm* ultimately demonstrates that the swarm's "Ungestalt" is, in fact, the yrr's *Gestalt*. Since the yrr's swarming behaviour and shapeshifting abilities are a crucial part of their biological and cultural identity, and their amorphous form as well as cultural experiences are written into their DNA, they are always a shapeless figure with a stable identity. The yrr—precisely because they are a culture of circulation and thrive in circulatory, global environments—serve as an ideal projection screen to visualize how and why circulatory, global phenomena are the biggest threat to the novel's human protagonists. As a constant in flux, the yrr's genetic, reproductive capabilities moreover provide an answer on how to counteract the allegedly negative effects of global, circulatory changes. The portrayal of human existence, connectivity, and collectivity, then, throws into sharp relief the exact nature of cultural anxieties about circulation, and formulates a dystopian universe to point to a utopian solution.

## Phony Supervillains and True Heroes: Anti-Americanism and German Environmentalism in *Der Schwarm*

"Cultures of circulation," say Lee and LiPuma, "are created and animated by the cultural forms that circulate through them" (192). Aronczyk and Craig get to the heart of Lee's and LiPuma's argument further when explaining: "It is in the process of circulation of cultural forms such as the novel or the financial derivative that such social imaginaries as the nation or the market are created and understood" (93). These conclusions thus pose the question of the role *Der Schwarm* has as a novel circulating, along with the book's ideas, within German culture. In the context of the German book publishing industry, Schätzing's book is indeed a phenomenon of circulation. German bestseller lists featured *Der Schwarm* for almost two years; its author received several awards, among them the 2005 Deutscher Krimi Preis and Kurd-Laßwitz-Preis; a total of 4.5 million books have been published; the novel has been translated into 27 different languages; a two-hour multi-media show reading combined excerpts from the novel, "discussions" with the characters, music, and film clippings; and even the lackluster "Making of *Der Schwarm*" trailer, only posted on YouTube in 2008, has over one-hundred-thousand views.[46] According to Schätzing, the thousand-page book's overwhelming success took him and his publisher, Kiepenheuer & Witsch, by surprise ("TV total").[47]

Despite—or perhaps because of—its striking success, the novel has garnered plenty of criticism over the years.[48] Reviewers have found fault with Schätzing's style of writing, the structuring of the plot and the building of suspense, or the mixing of genres.[49] In a way, the book's idiosyncratic composition of a fictional universe rooted in actual science—that is meticulously explained in long, expository passages—mirrors its alien protagonist: it defies easy genre classification and touches on a plethora of topical subjects.[50] Rolf Löchel bashes the "scientific

tome" for its "plot, character-painting, the representation of gender roles and finally its style."[51] The novel has, however, been praised for exactly the same aspects it has been criticized for. The *Dresdner Neueste Nachrichten* gushes about the "[c]aptivating dialogues" and "the fascinating protagonists" (qtd. in "Frank Schätzing: *Der Schwarm*"), and Tobias Rapp concludes in the *taz*: "This book wants to be read, from the beginning to the end, mornings, evenings, nights. Outside, worlds could fall apart, one wouldn't even realize it."[52] These diverse reactions demonstrate the book's potential to speak to various reader interests and provides one explanation for its wide circulation. Robin Detje ultimately assesses Schätzing's novel in the *Süddeutsche Zeitung* as "[a] case of premium trash, which shouldn't be scorned, a quality product of the culture industry, that the rest of the German industry hasn't managed to produce in a very long time" (16).[53] Felt to be both serious as well as trash literature, *Der Schwarm* polarizes—and points to its own performative, circulatory power.[54] It is in the novel and its themes, as well as in its discussion and reiteration of its topics that another culture of circulation—and thus, in fact, a national one—unfolds.

While these reviews, to a certain degree, differ in their assessment of the novel, reviewers nevertheless share a concern for situating Schätzing's opus within the German cultural, especially literary, landscape. By doing so, they identify certain themes as worthy of discussion, and recirculate them in their own writing. Cases in point are the novel's environmental concerns and its obnoxious, blunt anti-Americanism. In *Der Schwarm*, American protagonists, in fact, turn out to be the real supervillains of the story, as the United States of America ultimately poses a greater threat to Schätzing's world than the mysterious, alien organism of the yrr. In a nutshell, American protagonists, all of whom hold high-ranking, governmental or military posts, are portrayed as one-sided and clichéd, as arrogant and ignorant, as ruthless and power-hungry, and as unethical and mendacious. American Judith Li, responsible for the US Navy, emerges as the main antagonist: she deceives her international collaborators, and even commits murder when pursuing her own agenda in the fight against the yrr. It is worth noting—in reference to the earlier discussion on the yrr's appearance and swarms' "eyes"—that Li has blue eyes (cf. 801).[55] Since she has the ear of the American president—who is portrayed as a rather naïve, religious buffoon—her character stands in for a seemingly unified America that threatens the global community with its self-serving, short-sighted, bellicose, and even lunatic strategies. These strategies involve the extinction of the yrr with biological warfare, a plan that is not only futile but would also accelerate the overall destruction of the earth and, therefore, annihilate humankind. Working for the CIA, Li's fellow American Jack Vanderbilt not only resembles her villainous characterization but they also share the same fate: both Li and Vanderbilt lose their lives as a consequence of other, more likeable and relatable, protagonists' defending their lives against the Americans' cowardly attacks.[56] The implementation of American objectives, which the American protagonists pursue relentlessly and in secret, takes place via sophisticated surveillance and military technology. The novel thus presents a case of "friends" spying on "friends," foreshadowing the global surveillance disclosure scandal from 2013. In the context of a globalized, connected world, the United States in *Der Schwarm* represent a world order in which international cooperation and consideration of others' interests is thus seen as detrimental to one's own national benefits: "'America is the world,'" says Li (802). In his examination of anti-Americanism in European literature, Jesper Gulddal diagnoses Schätzing's depiction of American culture as a "remarkably aggressive … type of anti-Americanism" ("'The One Great Hyperpower'" 686). "Not content with portraying his American characters as greedy, violent psychopaths," Gulddal argues, "Schätzing takes great care to place the US on the wrong side of the novel's main ideological fault lines. … In the light of this

remarkably one-sided distribution of guilt, it is difficult not to see *Der Schwarm* as a massive indictment, not only of specific American policies, but of America and Americans as such" (690).[57]

In their evaluation of Schätzing's novel, some reviews not only comment on but also express a similar anti-American sentiment. In his rather enthusiastic discussion of *Der Schwarm*, Rapp denounces the thriller's blatant use of American stereotypes by citing one of those common clichés: "And, therefore, the only reproach one can accuse the book of is one that Europeans commonly say about Americans: to have an ideologically simple worldview."[58] While this common cliché also boils down Schätzing's characterizations of his American protagonists, Rapp's critique of *Der Schwarm's* simple ideology does, in fact, not deny that there is truth in the stereotype of the ignorant American in general. The *Frankfurter Allgemeine Zeitung* excuses and essentially normalizes the "obtrusive anti-Americanism" because "[t]his attitude is part of a differentiation strategy within a literary genre that has been dominated by American authors for a long time; and this strategy is rather contradictory because Schätzing's tinderlike fiction is clearly fuelled by Hollywood's disaster scenarios" ("Erdbeben" 44).[59] This contradictory, ambiguous relationship with American culture—a mix between antipathy and admiration—also finds expression in Detje's discussion of Schätzing's "premium trash," in which he moreover calls the "classic suspense novel … a US-produced replacement of literature for technocrats."[60] In other words, the part of the novel that makes it "trash" is American.[61] The following exchange between Li and the President in *Der Schwarm* mirrors Detje's assessment of American literature in its sentiment: "'The United States will save the world. *You* will save the world,'" Li says. "'Just like in the movies, huh?'" the President asks, to which Li responds: "'Better than that'" (748). The novel's blatant anti-Americanism and the echoing of such sentiments in reviews of *Der Schwarm* point to anxieties about the circulation of American culture in German society. The fact that, in 2014, the right-wing populist group Pegida, Patriotische Europäer gegen die Islamisierung des Abendlandes, originally debated, as Volker Weiß reports, whether to name their association Pegada, Patriotische Europäer gegen die Amerikanisierung des Abendlandes, indicates the extent to which anti-Americanism pervades German society today (219-220).[62] By demarcating American culture in distinctly different, negative terms, the novel and reviews not only participate in normalizing and invigorating such stereotypes but also outline what constitutes European and German culture via contrast.

One characteristic identified as typically German is *Der Schwarm's* main subject matter, namely its environmental themes. "Schätzing's German eco-heal-the-world-nature" seems to have struck a chord—"[in] the fight for a profitable German national culture"—with readers, reviewers, and scholars (Detje).[63] The novel explores climate change and global warming, overfishing and deforestation, extinction of species and plants, and human responsibility for ecological troubles. These issues culminate in the quintessential question of how man should relate to nature, and vice versa. *Der Schwarm* argues that the answer to this question is one of Weltanschauung. "[T]he desire to dominate nature is seen as typically American, whereas the more harmonious, 'understanding' approach is reserved for non-Americans like Native American-Canadian Leon Anawak, Norwegian Sigur Johanson and German Gerhardt [sic] Bohrmann," Gulddal further explains the novel's ideological fault lines ("'The One Great Hyperpower'" 689).[64] It is worth noting that Gulddal excludes the yrr in this brief comparison, who, after all, are the epitome of living in harmony with nature. To ensure survival, protagonists of *Der Schwarm* have to adopt a mindset that perceives nature as an equal and intrinsically connected element of human existence before becoming the true heroes of Schätzing's novel.

In her eco-critical analysis, Dürbeck, for instance, highlights how the "novel makes a serious effort to popularise eco-system thinking" and serves as a "warning" ("Popular Science" 27).[65] However, "the novel's support for environmental concerns is limited," because "the crisis may not be as bad as environmentalists claim" ("Popular Science" 27).[66] Together with Peter H. Feindt, Dürbeck also demonstrates how *Der Schwarm* presents "[e]cological understanding … as a bottom-up process that has an anti-establishment component [ö]kologisches Verstehen … als bottom-up-Prozess mit einer Anti-Establishment-Komponente" (222).[67] Traditionally, environmental issues and ecological policies have played an important role in German society. This is also reflected in the "Umweltstudie 2004," published by the Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).[68] The study, under the direction of Udo Kuckartz und Anke Rheingans-Heintze, concludes that 92% of the population attach importance to environmentalism ("Umweltpolitik" 9, 15). When asked what the most important issues are that Germany has to face as a country, environmental protection, together with social justice, ranked third, preceded only by the job market and economy ("Umweltpolitik" 14). In comparison with previous years, the survey showed that Germans were notably increasingly anxious about the environment, especially in relation to the well-being of future generations ("Umweltpolitik" 9, 23). "Moreover, a majority of 58% respectively believes that the limits to growth have been reached, and that we will face a natural disaster if we continue to act the way we have been" (Kuckartz and Rheingans-Heintze, "Umweltpolitik" 23, 9).[69] Concerns about environmental disasters were predominantly stronger when evaluated as global risks (Kuckartz and Rheingans-Heintze, "Umweltpolitik" 28). The growing perception that nature poses a risk is also reflected in a shift in understanding nature: in 2004, a quarter of Germans—over 5% more than in 2002—shared the mindset that nature is intrinsically unpredictable (Kuckartz and Rheingans-Heintze, "Umweltpolitik" 32). *Der Schwarm* thus not only engages with an issue that matters to a vast majority of Germans who generally view themselves as eco-friendly but the novel also picks up on the gradually increasing cultural anxiety about the future of the environment and potential catastrophes in a global context.

This anxious mindset about environmental, global issues is then mirrored in Schätzing's eco-thriller, which conveys environmental concerns in "apocalyptic rhetoric" ("Popular Science" 26)[70] or the genre of "disaster" (Dayıoğlu-Yücel). Yasemin Dayıoğlu-Yücel notes that German disaster literature—despite the popularity of the genre among readers—is rare: "A reason, it is assumed, is the continuing investment of German authors with German-specific, historical crises" (61; cf. 63 & 69).[71] She further contends that German authors are in general apprehensive about fictionalizing actual catastrophes (69). *Der Schwarm* circumnavigates these cultural inhibitions by combining the contemporary disaster genre with German present-day anxieties about the environment and globalization. A closer look reveals, however, that Schätzing couches a key German domestic issue and historically the crux of German identity in the guise of ecological disaster and ethnic as well as national stereotyping. The explicit, obnoxious anti-Americanism, which pitches phony American supervillains against a group of true, heroic environmentalists, indicates the actual "crisis" Schätzing's novel is exploring, one that has permeating German culture like a leitmotif for centuries: What does it mean to be German?[72] The following discussion thus examines how *Der Schwarm* imagines a German collective via anti-Semitic and philo-American-Indian stereotypes.

## The Case Against Cultures of Circulation:
## Fighting back with Anti-Semitism and Clichés of American Indians

In opposition to the American model of global dominance, the international team of experts—the eco-friendly heroes of *Der Schwarm* minus their American members—appear to represent a human social structure of global connectivity and collectivity. In response to the uprising of the sea, an international taskforce is set up by the novel's global community. In Norway, Johanson, along with biologist Gerhard Bohrmann in Germany, examines a new species of worms, which eventually trigger a tsunami that devastates much of Northern Europe. Researcher Leon Anawak analyzes whale attacks on tourists and commercial ships near Vancouver, Canada, while his French colleague, Bernhard Roche, studies the connection between toxic lobsters and a fatal epidemic that afflicts the population of France. The group's joint investigations, which are secretly observed by their American collaborators, eventually lead to the discovery of the yrr as the sole culprit behind the apocalyptic maritime attacks and occurrences. The international composition of the research unit, the group's encounter with the yrr, and the mutual attempts to communicate with each other emphasize the importance—even necessity—of intercultural competence. Dayıoğlu-Yücel comes to the conclusion that "[g]etting acquainted with the yrr resembles a lesson in intercultural sensitivity" (65).[73] Quoting the following passage from the book, Dayıoğlu-Yücel argues that the novel fosters "[c]ritical awareness … in dealing with 'Otherness'" (65)[74]: "It's hard for us [humans] to accept that our values aren't shared by other civilisations, but it's a problem we face all the time. Every human culture finds aliens on its doorstep – or just across the border" (580).[75] The novel thus seems to stress—by emphasizing the heroes' eco-friendly, harmonious mindset and ability to successfully build an international, collaborative network of researchers and, ultimately, friends—that cross-cultural, interpersonal communication is a crucial skill and critical imperative for living sustainably in a globally connected world. This message of the apparently vital significance of living a harmonious, globally connected togetherness—of existing as the collective of the human race—is, often subtly, undermined in a variety of ways that posit quite a different notion of collectivity. The novel's rampant anti-Americanism is a first, explicit indication of what terrors loom and, as a closer look at the members of the taskforce reveals, should ultimately remain beyond "the border." In a nutshell, *Der Schwarm* voices and engages with anxieties about human aliens crossing the "doorstep" and entering the ethnic, national house.

A case in point of such a "human" alien is Mick Rubin. Neither Rubin's national, ethnic, nor religious affiliations are stated explicitly.[76] His name, however, suggests that Rubin is Jewish. "Rubin" is a variant of the Hebrew "Reuben," generally interpreted as meaning "see, a son!" The name—"Ruben" in German—stems from the first-born child of Jacob, who later founded the Israelite tribe by the same name. Reuben betrayed his father by having sexual relations with Jacob's mistress, which ultimately cost him his status as a first-born son.[77] "The Jew has therefore a strong predilection for the strange persons of the Old Testament, because he recognizes them as his ancestors and blood relatives. The Jews thus borrow almost all of their names from the bible," a German book on naming explained in 1800, listing "Ruben" among those biblical names. "This might have contributed a lot to the fact that Christians rarely use names from the Old Testament but instead from the circle of Saints, to differentiate themselves from the Jews, this, by them, so very much hated and subdued nation," the author further adds to his account of Jewish and Christian naming conventions (Wiarda 89).[78] Names as a marker of Jewishness and, by extension, evidence of everyday anti-Semitism have a long tradition in German-speaking cultures. Dietz

Bering has compellingly shown how Jewish names evolved as a Jewish stigma and a means of prejudice and ostracism at the beginning of the 19th century, culminating in the emergence of "an entire cartography of anti-Semitic labelled names" (24).[79] With Jews gradually assimilating into German society, names turned into an apparently simple label of assigning and maintaining difference. This "cartography" of names, Bering argues, ultimately facilitated the dissemination of National Socialism's lethal anti-Semitism. A literary example and, therefore, predecessor to Schätzing's character is, moreover, Theodor Fontane's Ebenezer Rubehn, later renamed Ruben, in *L'Adultera* (1880), a baptized Jew and "American correspondent working for a bank."[80] In this cultural context, Rubin's first name, Mick, then indicates Rubin's Jewishness by way of dubious assimilation: "Michael" is, after all, among the most common contemporary names in Western countries.[81]

As Monika Schwarz-Friesel and Jehuda Reinharz demonstrate in their ground-breaking study on anti-Semitic language in the 21st century, anti-Semitism is alive and well across all levels of German society—a fact that is generally downplayed in German public discourses. By analyzing thousands of letters and e-mails sent between 2002 and 2012 to the Zentralrat der Juden,[82] as well as to Israeli embassies across Western Europe, Schwarz-Friesel and Reinharz demonstrate how stereotypes in circulation since the Middle Ages continue to transmit hatred of Jews, which nowadays often comes in the form of emotional language and as criticism of Israeli politics. "An antisemitic attitude usually rests on a conceptualization of JEWS characterized by negative emotions and stereotypes," the authors explain (17). Among these still common clichés are: Jews as "'traitors;'" "'liars;'" "'disloyal parasites;'" "'greedy profiteers;'" "'sly conspirators;'" "'pigs, rats, microbes, plague, boils;'" "'brutes' (*Unmenschen*);" "'devils' (*Teufel*);" and "'fiends' or 'monsters' (*Unholde*)" (Schwarz-Friesel, "Educated Anti-Semitism" 172, 178). In their plural form, these derogatory expressions—all of which are understood to be an essential, innate part of Jews' nature—already point to the prevalent practice of conceiving of Jewish people as a group, namely as a "collective menace" of nonhumans (Schwarz-Friesel, "Educated Anti-Semitism" 172). "In the mental model of the anti-Semitic worldview," Schwarz-Friesel concludes soberingly, "Jews fill the conceptual slot of 'one not belonging to the human race' or 'one not belonging to our society'" ("Educated Anti-Semitism" 170). Schwarz-Friesel's and Reinharz's observation that "[j]udeophobic phrases and structures are kept alive in communicative memory and still influence the collective human mind" provide one explanation of the continuing prevalence but also circulation of anti-Semitic attitudes in contemporary German society (xii). Language serves as a vehicle transporting and reproducing anti-Semitic stereotypes: "Hence, anti-Semitism can be seen as a cultural code engraved in collective memory" (Schwarz-Friesel, "Educated Anti-Semitism" 166).

In the context of this discussion of *Der Schwarm*, Schwarz-Friesel's and Reinharz's findings—besides Bering's research on names—demonstrate how Rubin's characterization is essentially the embodiment of anti-Semitic clichés. In addition to the name, other traits, not only traditionally but, in fact, at the time of the novel's conception indicating anti-Semitic thinking, identify Rubin as "Jewish." These anti-Semitic associations include betrayal and disloyalty, deception and masquerade, rootlessness, greed, and a monstrous body. In comparison to other protagonists, the novel offers little backstory to Rubin's character: he is "probably one of the best biologists" (786), lived in Manchester at some point in his life, and now works secretly for the CIA. He is described as an unpleasant, opportunistic person, and is unable to build lasting, or even friendly relationships with other members of the taskforce. Rubin is disloyal to his colleagues by working for the CIA in secret, and he betrays the CIA by divulging their undisclosed plans to

others (cf. 786). He is a proven liar (786), and "would sell his own grandmother for a taste of fame" (787). When fighting for his life, Rubin, at one point, "howled, his arms and legs waving in the air" like vermin (797).

Rubin, furthermore, becomes collateral damage when the yrr invade his brain in the final showdown between the heroic taskforce and the American supervillains. Although humans are downed, ripped apart, crushed, eaten, penetrated, invaded, infected, mutated, and turned crazy in the war with the yrr, Rubin's fate is, nevertheless, particularly grisly. "Weaver fought back revulsion and fear" when looking at her colleague's corpse floating among two others (808). Rubin's body, now indeed possessed by alien microbes, turns into a scientific experiment when it is tampered and appropriated by the remaining members of the taskforce. They infect "nearly two litres of the [artificial yrr] pheromone solution"[83] into Rubin's flesh—precisely into those body parts (tongue, nose, eyes, ears, fingertips, toes (cf. 818–819)) that give him a human, individual identity (820). "Rubin's body was unbelievably heavy, saturated with water and pheromone fluid. His head jerked back and forth, eyes glazed and staring emptily into space" (822). His gruesome death ensures the survival of the rest of humankind as his—ultimately monstrous—body becomes the medium that facilitates communication with the yrr. Weaver therefore releases Rubin's corpse, "[a] dead messenger, the bearer of their hopes" (848), into the deep ocean:

> The hostile environment squashes his organs and his flesh, crushing his skull, snapping his bones, and squeezing the fluid from his body. … The contracting jelly has squashed him against the side of the view dome, and he stares at her [Weaver] through two dark holes. Hydrostatic pressure has forced out his eyeballs. Dark fluid seeps out of the cavities, then the body detaches itself slowly from the boat and falls into the night. Now he is just a shadow against the illuminated backdrop, body spinning in curious movements as though he were dancing slowly and awkwardly in honor of some heathen God. (860)

In this moment, which takes place shortly before Weaver encounters the yrr queen, Rubin's corpse offers an aesthetic experience of a different kind: his body discloses his true, othered, and monstrous self. Part of this alien identity is the ability to masquerade as someone—though not anyone—else: "Rubin is saying: *I am the yrr*" (863). Rubin demonstrates that he is not, implying he never was, a "life-form any more" (850). His body only "shows up on the sonar … [as] the outlines of a human form" (861). At this point, it has no eyes anymore. The dark, unnatural eye sockets point to the novel's cover: after all, nothing but black darkness is at the center of the blue iris. In the end, Rubin incarnates almost every imaginable anti-Semitic stereotype circulating in German contemporary culture, culminating in the Christian accusation of Jews being heathens and sinners. However, his biggest deception, sonar technology reveals, is pretending to be a human being.

While the discussion above demonstrates that the Americans are the real supervillains in *Der Schwarm*, I argue that Rubin, more so than the yrr, emerges as the embodiment of cultural anxieties about global, circulatory phenomena. Rubin's anti-Semitic characterization and grisly fate suggest that fears about the effects of globalization and circulation manifest themselves especially in anxieties about ethnic, national, and cultural identities. By the end of the novel, Rubin has largely assumed the yrr's role of an angst-inducing alien in Schätzing's fictional universe. In a nutshell, *Der Schwarm's* true "Ungestalt" is Mick Rubin. The instant he becomes a "shadow" is also the moment the yrr queen appears for the first time. This encounter equals a revelation: the yrr turn from an amorphous swarm into a recognizable and classifiable *Gestalt*, while Rubin's

body dissolves into "Ungestalt." Anti-Semitic descriptions such as "liar," "traitor," or "rootlessness" add to the perception of Rubin as a constantly shifting form, which is nevertheless shapeless and, therefore, not clearly identifiable. Although Rubin's body is clearly missing vital components in order to be a whole entity, it nonetheless appears as exactly this—a malformed, unaesthetic whole. In the context of prevalent anti-Semitic stereotypes, Rubin then signifies *all* Jews, an imagined biological and cultural collective without a center.

According to the textual, generic function of the yrr swarm and the narrative logic of the novel, Rubin presents a threat that needs to be neutralized. After releasing Rubin's corpse into the ocean, Weaver remembers friends and foes, with the exception of Rubin. In other words, Rubin is not only "eject[ed] from the boat" (860) but indeed erased from cultural memory and, by implication, the human race. The omission of Rubin from Weaver's ritual of remembrance receives further significance when factoring in the yrr's genetic memory and its purpose in Schätzing's fictional universe. The yrr emerge as the superior life-form because their genetic memory and reproductive practices ensure their biological as well as cultural procreation and identity across time and space, even in changing environments. Rubin's expulsion can thus be read as an elimination of elements that are perceived to permanently change the make-up of collectives and identities. The larger, underlying message Schätzing's eco-thriller conveys is then that global, circulatory phenomena are a threat to national and cultural identities—particularly, if those phenomena describe the mobility, immigration, and mixing of other ethnicities and cultures. The deliberate forgetting of Rubin is moreover reflective of contemporary debates on Germany's memory culture of the Holocaust. The prominence of the Memorial to the Murdered Jews of Europe in the "Du bist Deutschland" campaign signals the central role the country's National Socialist past has played in German culture since the end of the Second World War. The question if the Holocaust should remain a central tenet of German identity, however, has (re-)entered the mainstream political discourse in the 2017 Federal Election and is therefore up for renegotiation.[84] Schätzing's *Der Schwarm*, via its insufferable anti-Semitic treatment of Rubin, subtly added fire to this discussion years ago.

The novel propagates the idea of homogeneous ethnic and national collectives not only via negative anti-American stereotypes and its anti-Semitic, malicious characterization of Rubin but also by offering a positive—nonetheless equally stereotypical—counterexample of an ideal collective, namely Leon Anawak. Although Anawak is Canadian Inuit, his character, I argue, stands in for a German protagonist, and, in fact, explores Germanness. German culture's love affair with "Indianer,"[85] as well as the cultural practice of using them as a means to construct German identity, has a long, intricate history. This special relationship plays out in countless (children) books, movies, and on stage. It also takes place in museum exhibitions, people's role-playing activities across Germany, and tourists travelling to North America. The most prominent example of Germans' fascination with "Indianer" is Karl May's Winnetou. As the protagonist of countless stories written by May between 1875 and 1910, Winnetou, Apache chief and blood brother to the German Wild West hero Old Shatterhand, made May into one of Germany's best-selling authors of all time, inspired several film adaptations, and prompted 372.646 people, a record attendance, to visit Bad Segeberg's 66th Karl May Festival this year alone (cf. "Winnetou Geheimnis").[86]

Hartmut Lutz has aptly termed this cultural investment in "Indianer" "*deutsche Indianertümelei*—German Indianthusiasm" ("German Indianthusiasm" 167). "Indianthusiasm," Lutz states, describes "a yearning for all things Indian, a fascination with American Indians, a romanticizing about a supposed Indian essence" ("German Indianthusiasm" 168). For H. Glenn

Penny, German culture's fascination with "Indianer" across different centuries is best captured by Johann Wolfgang von Goethe's biological and cultural concept of "elective affinities."[87] "Throughout the nineteenth and twentieth centuries, many millions of Germans repeatedly chose to embrace a sense of kinship with American Indians that stemmed from affinities of 'mind and soul,'" Penny explains (*Kindred by Choice* xi). This relationship, which Penny terms "kindred by choice," reveals "an ongoing conflict within German cultures about Germans' place in the modern world—a conflict that was driven, to some degree, by the melancholy recognition that Germans were both victims and proponents of the homogenizing forces of modern Western civilization" (*Kindred by Choice* xiii). In a similar vein, Frank Usbeck terms "[t]he most important motif of Indian imagery … the 'fellow tribesmen' motif, [which] postulates similarities between Germans and Native Americans in character, historical development, and in their relationship to the natural environment" (3). Among those likenesses, Usbeck identifies "[h]onesty, courage, intuition, emotionality, and even a melancholy disposition[, as well as] … warfare, spirituality, and leadership structures" (3). Echoing Lutz, Penny, and others, Usbeck concludes that indigeneity is a key part of the connections that Germans have drawn between their own culture and "Indianer" societies, "and it established the notion of Germans as the descendants of a pure and ferocious aboriginal people still in touch with their roots" (3). Usbeck thus argues that "Indianthusiasm" is essentially "Germanthusiasm" (3).[88]

Mirroring the established stereotypes of "Indianer" circulating for centuries within German culture, Anawak, holding a PhD in animal behaviour with a specialization in whales, is highly educated and conscious of the environment; thoughtful and forgiving; honest and loyal; courageous and genuine; and, thus, likable and easily to befriend. Although he is characterized as the exact opposite of Rubin, Anawak shares with his "Jewish" colleague a body that causes unease. At the beginning of the novel, Anawak's, like Rubin's, origins remain nebulous, and he shows ambiguous and conflicted feelings about his identity as an Inuit. His own, as well as others' discomfort about his Inuit heritage comes to light in his frequent unease about his appearance, which looks less white than his behaviour suggests. "The reporter made a note of something. 'I was thinking in particular of the people where you come from, Dr . . .' 'I come from around here,' said Anawak curtly. The journalist stared at him in surprise" (122). The enigma of Anawak's true racial identity and of coming to terms with his origins—with his "wide cheekbones, dark skin and Mongolian eyes" (517)—is the most conflict-ridden, most important part of his storyline.[89]

Anawak's identity crisis is solved when he returns to his place of birth—Nunavat—in the wake of his estranged father's death. His visit to his "homeland on the edge of the Arctic Circle" (518), presently a Canadian territory, and the reunion with his biological family after almost twenty years amounts to a reconciliation with his biological and cultural ancestry. "It was coming back to him at giddying speed. The memories appeared before him like silhouettes in a snowstorm, drawing him into the past … Anawak felt his heart spring forward. He was home" (521). During a brief trip "*[o]n the land*[,] ... three words [that] encapsulated the Inuit philosophy of life" (535), Anawak "look[ed] at the scenes from his childhood, and felt as though a weight had been lifted from his chest" (539). In the end, the physical return to his "homeland" and the reclaiming of Inuit history, knowledge, and identity that Anawak undergoes—not his scientific training—facilitate the armistice with the yrr and ensure his own survival. "They were in the Greenland Sea, in the Arctic, his territory. He was an Inuk through and through. He'd been born in the Arctic, and he belonged there. But he wasn't going to die there, and neither was Crowe" (833). The re-connection with his Inuit roots enables Anawak and Weaver, who experiences a similar journey into her own

past on the way to meeting the yrr, to move forward to the next level of their relationship at the end of *Der Schwarm*, signalling a collective, even (re)productive future.

"German 'Indianthusiasm,'" Lutz explains further, "is racialized in that it refers to Indianness (*Indianertum*) as an essentializing bioracial and, concomitantly, cultural ethnic identity that ossifies into stereotype" ("German Indianthusiasm" 169). In other words, much like anti-Semitism, "Indianthusiasm" functions as a cultural code inscribed in German collective memory. For Lutz, they are different sides of the same coin: "It appears that both anti-Semitism and *Indianertümelei* are fed by the same political and cultural processes that went into the construction of the German nation state" ("German Indianthusiasm" 168). The prevailing presence of anti-Americanism, anti-Semitism, and "Indianthusiasm" in *Der Schwarm* suggests that the novel is, in fact, a document of "Germanthusiasm." In the cultural context of an alien, natural "oceanscape," which is under threat because of global, circulatory phenomena and trends, the novel develops memory and identity politics that are based on blood, genetic, natural, and essential relations that constitute distinct biological and cultural identities with collective memories.

## The Biological Limits of Global Connection: Imagining "Bio-Deutschland"

The previous discussions on swarms and the yrr as a culture of circulation; on environmental metaphors of globalization and the novel's ecological plotlines; and on the use of xenophobic and xenophilic stereotypes to imagine biological and cultural collectives demonstrate that *Der Schwarm* envisions an apocalyptic, catastrophic universe that is about the absence of distinct ethnic and national identities and cultures in a multicultural, globalized world. This "eco-systemic" scenario of a different kind first takes shape in the alien life-form of the yrr. They, as a biological and cultural swarming collective, model the ideal of circulating cultures in global environments. Their technological appearance, reminiscent of digital networking processes, prefigures not only their superior, mathematical intellect but also their intrinsic connectedness to other oceanic organisms and maritime animals. As a culture of circulation, the yrr process and pass on social and cultural knowledge and experiences genetically, and possess the ability to reproduce and maintain their distinctive, stable *Gestalt* across time and space. As such, the yrr serve as a screen that shows what *state* human collectives ought to assume to thrive.

The eco-thriller spells out the particular parameters of *state* further via the extensive use of anti-American, anti-Semitic, and "Indianer" clichés. While the novel's stereotypical portrayal of characters and narrative strands obviously differs depending on the respective bias that is presented, the use of such stereotypes paints an overall picture of a desire for the existence of an essential authentic ethnic national *state*. One of the novel's typical, scientifically charged discussions addresses the biological and cultural identity and memory politics of *Der Schwarm* directly:

> (Johanson) 'What we refer to as customs or culture is inscribed in our genes. Cultural evolution began in prehistoric times. … It's what we've been doing since the first axe was bartered for a slab of meat: going to war, congregating in social units, trading. Culture is part of our evolution. It allows us to survive in a stable condition—'

(Li) '… It's not something we like to dwell on, but genes are what's allowing us to have this conversation in the first place. We're so proud of our intellectual heritage, but it's just the result of biology. Culture is nothing but a set of successful patterns of behaviour grounded in our struggle to survive.'

(Johanson) 'Human evolution is just the interplay between genetic mutation and cultural change. We owe the growth of our brains to genetic mutations. It was biology that allowed us to speak. … Culture is the product of biological processes, and biological adaptation occurs in response to cultural change. … But you've pinpointed the problem: our much-vaunted cultural diversity is bounded by genetic limitations. And those limitations clearly separate our culture from the culture of non-human intelligent beings. … We could never adopt the values of a species whose biology isn't compatible with our own. They're our rivals in the struggle for habitat and resources.' (679)

This exchange between Johanson and Li corroborates the significance of biological processes for memory and identity conceptualizations in Schätzing's eco-thriller. While the novel seemingly promotes cultural awareness, intercultural communication, and global collaboration, this section suggests biology and genetics set definite limits to the extent of these encounters, exchanges, and understandings. In the end, the novel demonstrates that such biological, genetic limitations restrict the way diverse human collectives are able to form and communicate. *Der Schwarm's* environmental message of living in harmony with nature—aptly captured in the novel's epigraph "hishuk ish ts'awalk"[90]—then describes a universe in which biological and cultural collectives exist independently without mixing with each other.

Via its investment in biological and cultural collectives, *Der Schwarm* not only re-circulates cultural codes of traditionally common, "German" stereotypes but also reveals and fuels cultural currents in German contemporary culture. Jens Maier, politician of the Alternative für Deutschland (AfD)[91], stated, for instance, during the year of the 2017 federal election that the "creation of mixed people" "could no longer be tolerated"[92] (qtd. in Eichstädt). Maier, as well as more prominent AfD politicians, such as Alexander Gauland and, especially, Björn Höcke, have repeatedly called into question Germany's culture of Holocaust remembrance, demanding a recalibration of German post-war memory culture and national identity. Books like Thilo Sarrazin's 2010 "non"-fictional bestseller *Deutschland schafft sich ab. Wie wir unser Land aufs Spiel setzen* (2010)[93] re-introduced the concept of a collective, biological and cultural intelligence and made such a racist, genetic worldview, which includes the idea of hyper fertile Muslims, socially acceptable. Eloquently summarizing Sarrazin's xenophobic, biologistic beliefs, Christian Geyer writes:

> According to Sarrazin, basics are indeed biological. Cultural is indeed nothing but a code word for genetic. If one understands this relation, one will read Sarrazin's fears about 'cultural identity,' 'cultural essence,' and 'national character' with different, though biologically correct eyes. … The entire book reads like an anti-Muslim treatise based on genetics. … 'Deutschland schafft sich ab' tells the downfall of a nation.[94]

Sarrazin's book is, in other words, a way shorter, less fictional, more formal renarration of Schätzing's eco-thriller, which notably stands out for the absence of reproductive partnerships, families, and children.[95] Furthermore, the book's construction of an authentic, natural "German"

collective via its "Indianthusiasm" is mirrored in the 2016, three-part *Winnetou* remake of the 1960s originals by RTL. One reviewer titled the newly produced films "a German folktale" (Frank).[96] Rather than presenting scenes from the trilogy, the teaser trailer addresses German culture's fascination with "Indianer" and May's protagonist, featuring children playing "Cowboys and Indians," families watching the original films with Pierre Brice, and referring to Winnetou as "the blood brother of all of us" ("Winnetou-Teaser-Trailer").[97] "Every generation has their Winnetou," the nostalgic trailer ends ("Winnetou-Teaser-Trailer").[98]

These developments converge in the increasing prevalence of the term "biodeutsch." "Biodeutsch" suggests the existence of an essential, authentic, natural, and consanguineous body, which also hosts a collective cultural identity. While the term was originally created to ironically highlight the absurdity of the common category of "Deutsche mit Migrationshintergrund,"[99] the concept has made its way into mainstream German political discourse—and often no longer denotes its satirical origin (cf. Fetscher; Köhler). In the context of this project's larger interest in reproductive imaginations in German culture, *Der Schwarm*, thus, partakes in *Menschenbildung* by making humanness dependent on certain national and ethnic characteristics that are also transmitted via an imagined biological memory. In her analysis of Schätzing's novel, Horn reminds us that the book is a "Gedankenexperiment" "that not only explores the particular structure of existing knowledge but also thinks through its premises, applications, consequences, and pathologies" ("Leben ein Schwarm" 103).[100] In doing so, the novel creates cultural codes—textual and visual images—of what it means to be human during the era of circulation via its outlining of what it means to be an artificial alien in a globally connected world. The novel explicitly acknowledges this creative process via its engagement with filmic reproductions of aliens. To breathe life into the yrr and, in turn, into the "Ungestalt" of Rubin, Schätzing's *Der Schwarm* evokes several, well-known blockbusters. Films such as *War of the Planets* (1966), the *Alien* franchise (1979–2017), *Deep Impact* (1998), *Armageddon* (1998), *Contact* (1997), *Independence Day* (1996), or *The Abyss* (1989) are brought up as evidence of artificial, alien life-forms, a move that grants these beings an existence beyond the cinematic screen, transferring them from a fictional landscape to a scientific and historical one.[101] In German debates about aliens—"Deutsche mit Migrationshintergrund," migrants, and refugees—there is a tendency to emphasize the fact that these groups are humans.[102] Schätzing's *Der Schwarm* demonstrates why people even feel the need to state this simple, plain fact.

## Notes

1 "You are Germany." The campaign was created by a "Kollektiv aus Medienunternehmen und Agenturen" ("a collective of media companies and agencies;" e.g. Bertelsmann, Gruner und Jahr, Heise, Axel Springer Verlag, Bauer, Burda, Holtzbrinck, Spiegel, FAZ, Süddeutsche Zeitung, Öffentlich-Rechtlichen, RTL, Sat1, fischerAppelt, Jung von Matt, kempertrautmann (now thjnk), and many others; "Du bist Deutschland" *fischerAppelt*). It was successful insofar as it reached approximately 35% of Germans within two weeks—many of whom viewed the initiative in a positive light ("Du bist Deutschland" *fischerAppelt*). Its "Manifest" ("Manifesto") and several, different advertisements were published in newspapers and magazines (cf. "Manifest;" "Du bist Deutschland" *fischerAppelt*). The television spot, which features the soundtrack to *Forrest Gump* and is currently available on YouTube (cf. "Du bist Deutschland"), was initially broadcast on several German television channels on the same day during primetime (namely between 19.50 and 20.15), and it was also shown in approximately 2000 movie theaters across Germany. The campaign also made use of billboards, and organisers set up an online shop, where people were able to purchase stickers, hats, and buttons.

2 "Du bist der Baum;" "Du bist Deutschland."

3 "Ein Schmetterling kann einen Taifun auslösen;" "Du bist von allem ein Teil;" "Und alles ist ein Teil von dir;" "Du bist die Hand. Du bist 82 Millionen." The last statement refers to Germany's population size.

4 The initiative was primarily criticized for its implicit references to National Socialist ideology. For instance, the campaign's slogan "Du bist Deutschland" was a propagandistic statement used by National Socialists, and the campaign featured several corporations and well-known people who were implicated in the Nazis' rise and crimes (cf. "Du bist Deutschland: Betrachtungen;" Freiburg and Haas). These concerns were, however, rejected by organisers who often referred to the Holocaust Memorial—the only memorial featured in the television spot—as evidence of their commitment to remembering Germany's Nazi past appropriately. A second, less successful campaign, started in 2007, promoted more acceptance and openness toward children in Germany.

5 The following discussion will cite from the English translation, *The Swarm*, by Sally-Ann Spencer published by Hodder & Stoughton Ltd in 2006. When referring to Schätzing's novel, the German title, *Der Schwarm*, will, however, be used.

6 "Das Meer schlägt zurück."

7 "bio-German." "Bio" not only captures the biological, genetic, natural aspect, it also denotes "organic" and, thus, "environmentally friendly."

8 "Globale Intelligenz."

9 With the exception of American governmental organisations.

10 Appadurai explains the term as follows: "The new global cultural economy has to be understood as a complex, overlapping, disjunctive order, which cannot any longer be understood in terms of existing center-periphery models" (296).

11 Franklin et al. analyze particularly how the icon of the "blue planet" emerged as a metaphor for global processes. The "blue planet" emerged as representative of global connectivity because of space travel and the technological ability to take photographic footage of the earth. It is moreover worth noting that associations of space often resemble notions of the ocean, e.g. vastness, unexplored territories, or the (unknown) existence of alien species. In Schätzing's yrr, the three icons of the blue planet, the foetus, and the cell converge: as discussed in further depth below, the yrr are single-cell, self-reproducing organisms living in a blue environment.

12 Cf. Thacker; Horn "Schwärme."

13 The yrr's "tentacle" evokes the German collective's "giant hand" imagined in the "Du bist Deutschland" campaign. Julia Bodenburg's discussion of *Der Schwarm* compares the yrr's blue aesthetic to the symbol of the blue flower in German Romantic literature as an identity generating image (343-345).

14 Watson is now available for commercial use, and has been used in health care, the insurance industry, and even winegrowing (cf. "Watson"). The *New York Times* noted that "Watson, specifically, is a 'question answering machine' of a type that artificial intelligence researchers have struggled with for decades — a computer akin to the one on 'Star Trek' that can understand questions posed in natural language and answer them" (Markoff). As Schätzing is using IBM's Deep Blue software (cf. 587) to describe the yrr, the *New York Times* and IBM researcher David Ferrucci refer to the computer from the science-fiction television show *Star Trek* to explain Watson (cf. Markoff). After competing against Watson on *Jeopardy!*, Ken Jennings noted moreover: "I expected Watson's bag of cognitive tricks to be fairly shallow, but I felt an uneasy sense of familiarity as its programmers briefed us before the big match: The computer's techniques for unraveling *Jeopardy!* clues sounded just like mine. That machine zeroes in on key words in a clue, then combs its memory (in Watson's case, a 15-terabyte data bank of human knowledge) for clusters of associations with those words. It rigorously checks the top hits against all the contextual information it can muster: the category name; the kind of answer being sought; the time, place, and gender hinted at in the clue; and so on. And when it feels 'sure' enough, it decides to buzz. This is all an instant, intuitive process for a human *Jeopardy!* player, but I felt convinced that under the hood my brain was doing more or less the same thing." Jennings's experience, which made him and Rutter "the first knowledge-industry workers put out of work by the new generation of 'thinking' machines" (Jennings), suggests that distinctions between human and AI thought processes are gradually diminishing, and this opens up room for debating humanness.

15 In the novel, the process of developing a language to communicate with the yrr is repeatedly compared to efforts at contacting with extraterrestrial life. In this endeavour, Samantha Crowe, who works for SETI (Search for Extraterrestrial Intelligence) in the novel, plays a key role. Crowe appears to be based on Jodie Foster's character Ellie Arroway in the movie *Contact* (1997), a character who was, in turn, inspired by Jill Cornell Tarter, director of SETI Research.

16 The Five Eyes alliance includes the United States, the United Kingdom, Canada, Australia, and New Zealand. Zygmunt Bauman et al. point out how the Five Eyes alliance allowed the NSA to act—spy—globally, essentially extending its own technological abilities.

17 "Das Internet ist für uns alle Neuland. Und es ermöglicht auch Feinden und Gegnern unserer demokratischen Grundordnung natürlich, mit völlig neuen Möglichkeiten und völlig neuen Herangehensweisen unsere Art zu leben in Gefahr zu bringen." Merkel's comments are, for instance, available via the YouTube channel of the Deutsche Welle (cf. https://www.youtube.com/watch?v=2n_-lAf8GB4).

18 The fact that Merkel's cell phone, along with Germany's administrative district in Berlin, were among the NSA's targets ultimately caused particular ill-feelings among German officials as well as the public. A vast majority of Germans—over 80%—are familiar with Snowden and his revelations, as, for instance, a study on the perception of the Snowden and NSA scandal has shown ("Untersuchung zur Wahrnehmung" 5-7).

19 The term "Schland," a sort of loving nickname for "Deutschland," was created and, effectively, brought into circulation by Stefan Raab. The entertainment mogul first coined the word in the early 2000s when celebrating the German national soccer team and imitating chants by drunk soccer fans. He patented the term in August 2005. Cf. Leurs.

20 "1) für die Besiedlung oder wirtschaftliche Nutzung neu gewonnenes Land;" "2a) (seltener) neues, bisher unbekanntes, unerforschtes Land, Gebiet;" "2b) neues [bisher unbekanntes] Gebiet, auf dem noch keine Erfahrungen, Erkenntnisse gewonnen worden sind." Explanations in brackets are part of the original reference.

21 Watson's avatar, which appears, in contrast to the yrr, rather humanoid, and has been in use beyond Watson's television career, thus echoes the blue planet logo that Franklin et al. identified as one of globalization's main icons. This connection is further substantiated because Watson's avatar was inspired by IBM's Smarter Planet logo and initiative by the same name. Watson's predecessor, IBM's Deep Blue, is explicitly mentioned in *Der Schwarm* (cf. 587).

22 *Der Schwarm* has been translated from its original German into more than 20 languages. The covers of these translations are quite diverse and therefore reveal culturally specific anxieties. The English edition features a photo of a school of fish, apparently moving in a circle. The fish look rather natural but the photo nonetheless captures the ocean's and the yrr's mysterious nature. The Czech edition, *Vzpoura oceánů,* shows a picture of the stormy ocean with an amber-coloured fish eye on the bottom. One of the French editions, *Abysses*, shows a rather transparent jellyfish, which resembles a skull. The Polish *Odwet oceanu* depicts an actual fish eye disguised as a wave. The German cover thus emphasizes the yrr's technological characteristics more than some of the translated editions, and hints at particular German anxieties about surveillance. The same iris was, however, also used for Schätzing's non-fictional book *Nachrichten aus einem unbekannten Universum*, in which Schätzing further engages with his scientific research on oceanic life in a popular scientific manner.

23 Horn, for example, emphasizes how seeing swarming in action has a "hypnotische Wirkung" ("hypnotic effect") on human eyes, in particular swarms' "Undurchschaubarkeit" ("impenetrability") ("Leben ein Schwarm" 123). This interaction between two types of "eyes" further emphasizes swarms' aesthetic appeal. This fascination is, however, one characterized by uncanniness and, consequently, calls for reactions ranging from unease to horror. Swarms' eerie "eyes" thus echo reactions to the—often soulless—eyes of automatons, Homunculus, and Alraune (cf. Chapter 1). In her analysis of Alfred Hitchcock's *The Birds*, Horn stresses moreover that the swarming birds do not, in fact, sound like a natural, wild flock. Instead, the swarming animals resemble the noise of a "Bild- und Tonstörung" ("image and sound interference"; "Leben ein Schwarm" 102). "Das Schwärmen ereignet sich damit nicht so sehr im Bild, sondern am Ort des Blicks selbst, als Verwirrung und Störung der Möglichkeit, überhaupt zu sehen" ("Swarming thus does not take place in the image per se but rather at the location of the gaze itself, as confusion and disruption of the possibility to see at all"; "Leben ein Schwarm" 102).

24 "Schwärme haben Konjunktur."

25 The following scene from Crichton's *Prey* demonstrates this particular type of swarming warfare: "The behaviour of the three clouds clearly appeared coordinated. Now they were closing in. And suddenly one of the swarms sank down, engulfing the rabbit. The other two swarms fell on it moments later. The resulting particle cloud was so dense, it was hard to see the rabbit anymore" (148). In Crichton's *Prey*, the clouds of nano-machines pass on only those characteristics that prove most beneficial to the entire swarm. As will become clearer throughout the following discussion, Schätzing's yrr thus resemble Crichton's swarms in several aspects (e.g. laws of inheritance and evolution (transgenerational memory), exceptional reproductive abilities, and warfare).

26 Cf. Horn "Leben ein Schwarm" for a detailed analysis of the bird swarm in Hitchcock's horror thriller (101-102). She also discusses Lem and Crichton, and, of course, Schätzing ("Leben ein Schwarm"). The release of *The Birds* and *The Invincible* in the early 1960s might be related to an increasing interest in swarms in the field of computer networking technology at the same time. See for instance the following excerpt from J.C.R. Licklider's 1963 "Memorandum for Members and Affiliates of the Intergalactic Computer Network:" "There is an analogous problem, and probably a more difficult one, in the matter of language for the control of a network of computers.

Consider the situation in which several different centers are netted together, each center being highly individualistic and having its own special language and its own special way of doing things. Is it not desirable, or even necessary for all the centers to agree upon some language or, at least, upon some conventions for asking such questions as 'What language do you speak?' At this extreme, the problem is essentially the one discussed by science fiction writers: 'how do you get communications started among totally uncorrelated 'sapient' beings?' … Is there no such thing as a network-control language? (Does one, for example, simply control his own computer in such a way as to connect it into whatever part of the already-operating net he likes, and then shift over to an appropriate mode?)" Licklider's thoughts, which essentially led to the development of the Internet, anticipate discussions on networks and collectives, communication and language, and control and chaos that characterize discourses on swarms. His questions are moreover reflected in Schätzing's novel, which describes the yrr at one point as "[t]he deep-sea version of *The Birds*" (195).

27 For further discussion on swarms/swarming and the different examples referred to in this summarizing paragraph, see, for example: Paul de Armond provides an in-depth account of the Seattle protests. For an examination of global activist movements, cf. Brian Holmes on "swarmachine[s]" (528). See James Haywood Rolling Jr.'s *Swarm Intelligence* for a broader discussion on the role of group collaboration for generating creativity, which also looks at the Arab Spring as a case in point (especially chapter 2, 43-70). Cf. Hussain and Howard for an analysis of information technology's role in these protests: "In every single case, the inciting incidents of the Arab Spring were digitally mediated in some way," and only this form of connectedness and networking, the authors show, facilitated the political protests in different North African and Arabic countries (16). Cf. Rheingold's *Smart Mobs* as well. The YouTube channel of the Office of Naval Research features a demo of Locust ("LOCUST Demo;" cf. Smalley). Horn examines swarms as the "enemies of the future" and swarming in the context of enmity in "Die Zukunft der Feindschaft." Discourses on swarms and swarming thus refer—and generally discuss both—swarms as a phenomenon occurring in nature as well as certain human social behaviours. Cf. Horn and Gisi *Schwärme – Kollektive ohne Zentrum*. As well as Sebastian Vehlken's book *Zootechnologien. Eine Mediengeschichte der Schwarmforschung*, in which he argues for understanding swarms as "Zootechnologien" ("zootechnologies"): "In the case of swarms, it is no longer animals that serve as a model for mankind and its *technē*. What is noteworthy is rather the reciprocal interference of biological principles and the processes of information technology" ("Zootechnologies" 113; cited here from his article in English); Vehlken demonstrates compellingly how swarms, as "zootechnologies," have developed into a cultural technique. In the context of understanding swarms and swarming, the study of ants has traditionally played a significant role. Cf. therefore Niels Werber's *Ameisengesellschaft*, which demonstrates in particular how ants—and thus by implication swarms—have served for a diverse variety of social and political models, which often seem to be at odds with each other. Cf. Horn "Leben ein Schwarm" 103-104 for a brief summary of swarms in literature and cinema.

28 While discussions on swarming phenomena do not always differentiate between swarms, masses, mobs, or other groups of people, this examination does not equate swarms with such other social formations. Following Thacker's explanation, swarms differ from these types of crowds in the way individual elements are connected and organized: "Just any large grouping of people does not constitute a swarm. They may be crowds, masses, or mobs, but … a swarm is a particular mode of collective organization. While a single person may certainly exist without a swarm, a swarm is dependent upon a particular kind of constitutive power of individuals. Individuals are individuals of a different sort in swarms, combining localized decision-making and movement, local area consensus-building, and an affective capacity (circulation of affects) linking the individual to the swarm as a whole" ("Networks Part Two").

29 "Kollektive ohne Zentrum."

30 Ucañan's physiological reaction points to the aestheticized terror that swarms elicit, cf. the earlier discussion on swarms' "eyes," and especially Horn's analysis of Hitchcock's *The Birds* ("Das Leben ist ein Schwarm" 101-102). For the following discussion, it is significant that the unease swarms evoke lies in the *exact* moment when individual elements are no longer discernable.

31 Cf. Horn, "Leben ein Schwarm" 122.

32 In addition, Doris Hambuch underlines the significance of Weaver facilitating the final negotiations with the yrr: as a female journalist for popular science magazines, Weaver is "the fictional link between science and society, who in the end achieves a symbolic peace with the Yrr and thus saves the world for the time being" (49). It is important that this link is established via two protagonists that possess maternal and reproductive capabilities. For Bodenburg, this scene demonstrates how the swarm constructs subjectivity via an aestheticized exchange of looks (cf. 346).

33 "zwei Typen von Schwarm-Logiken;" "In der ersten Form folgt der Schwarm einer grundsätzlich zyklischen Logik. Er ist integriert in ein übergeordnetes Sozialgebilde, das auf den Zweck der Reproduktion ausgerichtet ist und somit einem Organismus ähnelt. In der zweiten Grundform beschreibt er ein Modell der spontanen Organisation, die nicht von der Kontrolle durch ein Zentrum abhängig ist, sondern aus der bloßen Interaktion *emergiert.*"

34 "Daseinszweck."

35 For bee colonies, the death of the queen means, at the very least, a re-orientation towards a new center—a new queen—or, as the worst-case scenario, the disintegration of the entire colony. In this context then, "political" is not to be understood as having absolute control or authoritarian power. Instead, the queen, as the center of all activities and reproductive facilitator, is political insofar as the social structure of the entire colony solely depends on her existence. Beekeepers, Johach explains, tie "Schwärmen an das Vorhandensein eines funktionablen Zentrums … : die Königin hält das Ganze zusammen, nicht weil sie als Führerin den Schwärmenden voranfliegt, sondern weil im Falle ihres Todes die soziale Koordination und zyklische Ordnung der gesamten Kolonie in sich zusammenbricht" ("swarming to the existence of a functionable center … : the queen holds the entire colony together, not because she flies ahead of the swarm as a leader but rather because her death would result in the breaking apart of the entire colony's social coordination and cyclical order;" 209). The queen thus also assumes representative power, especially since bee colonies and swarms are viewed as "societies," often in comparison to human forms of political and social organisation. Cf. Werber.

36 "[i]m Fall der Bienenkönigin fällt die biologische Funktion (Reproduktion) mit der politischen Funktion (Repräsentation) in eins."

37 Rubin, however, also clarifies at this point that the yrr possess more than one queen. He thus stresses their non-authoritarian social organisation, and emphasizes the role that biology plays in their collectivity. Cf. the following discussion.

38 The yrr's reproductive abilities are further substantiated by the fact that they essentially represent "Mother Nature": as the bee queen's death signals the dying off of the entire colony, the yrr's death would signify the demise of the entire eco-system. As such, the yrr, as a collective, personify nature's "queen."

39 "radikal neu;" "integriertes Ganzes."

40 "dynamisch und evolvieren in der Zeit;" "neuer und anderer Zustand des Systems."

41 "*das Lebendige ist irreduzibel emergent.*" Horn acknowledges in her introduction to *Kollektive ohne Zentrum*—in reference to Johach—that "der Bienen-Schwarm gerade kein Beispiel für ein Kollektiv ohne Zentrum [ist]" ("the bee swarm is indeed no case in point for a collective without a center;" "Leben ein Schwarm" 23). Horn nonetheless examines the yrr as a case in point of an emergent life-form. Her analysis therefore points to the yrr's hybrid nature: they have, in fact, accumulated characteristics from several other swarm-like beings.

42 The yrr's capability to control other species and to shapeshift into other animals puts emphasis on the perception of the yrr as *reproductive life*, especially since they maintain their distinct identity in those scenarios.

43 Cf. Chapter One. The desire to store knowledge is present in the Human Genome Project, which understands DNA as an instructional and historical book.

44 The yrr's superior memory further strengthens their computer-like nature.

45 "in modernen Fiktionen eine Bedrohung und ein Anderes des Menschen, eine Ungestalt – und doch auch eine Grundlage seiner Existenz;" "Ungestalt" means "unshapely shape." Cf. Horn "Ungestalt des Feindes."

46 Cf. "Der Schwarm" & "Buchreport;" Moreover, there have been rumours for years that the novel will be made into a Hollywood film (cf. "'Mehr Butter dazu!'"). So far, no official announcement has been released as to when such a film will actually be produced.

47 *Der Schwarm* is Schätzing's sixth book, yet the first one that was published with Kiepenheuer & Witsch. It was the thickest book Kiepenheuer & Witsch had ever published. Two years later, the publisher also distributed Schätzing's non-fiction book *Nachrichten aus einem unbekannten Universum*, which was based on research for *Der Schwarm,* and this also made it onto German bestseller lists. To some extent, the length of *Der Schwarm* came about by Schätzing's decision to include large passages of scientific explanations, which are, for instance, interlaced in the dialogue between characters. Schätzing, in fact, sought advice from over twenty scientists and other experts, which helped him to present facts and plotlines in as scientifically accurate a manner as possible. Some of these scientists were included as characters in the novel, which often received praised for imagining plausible scenarios and presenting scientific knowledge correctly (cf. particularly Andreas Böhn).

48 The novel has increasingly also garnered academic attention. Most scholars focus on *Der Schwarm*'s environmental and apocalyptic themes (cf. Dayioğlu-Yücel; Dürbeck "The Anthropocene" & "Popular Science;" Dürbeck and Feindt; Hambuch; Neumeyer, Nitzke "Katastrophe" & "Unvorhersehbare;" Ramponi; Wanning;

Zemanek). While Jesper Gulddal discusses the book's anti-Americanism ("'The One Great Hyperpower;'" *Anti-Americanism*), Bodenburg takes a closer look at Schätzing's swarm to discuss how swarms potentially serve as an ideal social model for modern, global democracies, concluding, however, "dass der Text für das Imaginäre des Schwarms genau auf jene Mechanismen/Techniken zurückgreift, die auch für die Subjekt- und Nationenbildung von Gewicht sind" ("that the text relies on the same mechanisms/techniques to imagine the swarms, which are also used for the construction of subjects and nations;" 330). Andreas Böhn examines compellingly how the novel generates a "'Poetik des Wissens'" ("'poetics of knowledge'").

49 Schätzing, in particular, received criticism for plagiarizing parts of his work from an online blog. A marine biologists took the author to court for copying passages from his website; Schätzing was ultimately cleared of the accusations (cf. "Kann denn Recherche Sünde sein?" and "Staatsanwaltschaft entkräftigt Plagiatsvorwurf"; Oels 176-177). International reviews viewed the novel in less favourable terms than discussions of the book in Germany. The long scientific sections often drew criticism. "Trouble is, somebody should have told him [Schätzing] that just because you did all that research, you do not need to include every last bit of it in the book! Especially when most of it is presented so poorly, in the sense of huge plot-slowing chunks and totally plot-irrelevant asides … The science, for the most part, is very good, but I see even the review in the science journal Nature says that it 'drastically slows the plot', which, for an apocalyptic disaster novel is not good … Great research aside, I am afraid I cannot recommend this book to SF readers" (Chester). See also Dodds: "I must admit that, notwithstanding its bestseller status (in Germany), I had a lot of trouble finishing The Swarm … On the positive side, Schatzing's science is very well researched and has a firm basis in current knowledge, maybe too much so: at times the book's poorly disguised multi-page infodumps [sic] read a bit like the introduction to an article in a scientific journal (I know I've written and read many), one almost expects footnotes or a bibliography. This gives the work a firm setting in objective reality, makes it believable to the average reader, but its didacticism does nothing for the flow of the action. Not that it is likely intended as an action thriller, but rather a thinking-man's thriller exposing possible outcomes of unsustainable human practices in using and managing the seas. …. This observation of mine may be a result of the fact that I tend to read SF more for entertainment than to expand my scientific knowledge—that I can do in journals or textbooks." German readers, the novel's success suggests, were, however, especially intrigued by the novel's particular, indeed didactic blend of science and fiction—a preference that mirrors German culture's overall investment in pedagogical approaches but also its book industry (cf. Böhn; the following discussion in regard to the popularity of the "disaster" genre). These reviews then point to Lee's and LiPuma's arguments on the "emergence" of cultures of circulation.

50 Bodenburg rightly notes: "Der Roman führt die Tradierung menschlicher Kultur vor. Er zitiert explizit eine Fülle von kulturellen Dokumenten – insbesondere Science Fiction-Filme und -Literatur –, die die Zukunft der Menschheit imaginieren [sic] und stellt heraus, wie stark anthropologisches Wissen und Gedächtniskonzepte von Vorstellungsbildern geprägt, ja allererst gezeugt sind" ("The novel demonstrates the passing on of human culture. It explicitly cites from a plethora of cultural documents – especially science fiction movies and literature –, which imagine the future of humankind [sic] and highlights how anthropological knowledge and concepts of memory are based on, indeed generated by, images of the imagination"; 341).

51 "Wissenschaftswälzer"; "Plot, in der Figurenzeichnung, in der Darstellung der Geschlechterverhältnisse und nicht zuletzt im Stil." Löchel moreover criticizes the novel for portraying the yrr as a communist society. Yasemin Dayioğlu-Yücel, for instance, cites an entire passage to demonstrate the "einfachen und wenig Raum für Interpretationen lassenden Sprache des Textes erhält" ("simple language of the text that leaves little room for interpreting"; 64), while the *TUHH spektrum* magazine praises Schätzing, who studied communication studies, for his "Gabe, komplexe Sachverhalte in eine allgemein verständliche Sprache zu kleiden" ("talent to present complex facts and data in universal, comprehensible language"; "editorial" 5).

52 "[h]inreißende Dialoge;" "Figuren, die den Leser in ihren Bann ziehen;" "Dieses Buch will gelesen werden, vom Anfang bis zum Ende, morgens, abends, nachts. Welten könnten draußen kollabieren, man würde es nicht bemerken."

53 "[e]in Fall von Edelschrott, den man nicht verachten soll, ein Qualitätsprodukt der Kulturindustrie, wie es der Rest der deutschen Industrie schon lange nicht mehr zustande bringt."

54 Rapp's observation of the fact that Kiepenheuer & Witsch published *Der Schwarm* points to the agency publishers have in a circulatory market. Rapp notes that Kiepenheuer & Witsch opened up a different audience for Schätzing, namely "Nutzer des Suhrkamp-Hanser-Rowohlt-Systems" ("user of the Suhrkamp-Hanser-Rowohlt-system") who may not have picked up the book if it had not featured the Kiepenheuer & Witsch logo.

55 Li's portrayal moreover substantiates the criticism that the novel is sexist. Li's characterization as a tough working woman mirrors typical clichés of women working in difficult, challenging, and male-dominated environments.

At one point, she is referred to as a "witch" (780). Cf. Löchel but also Hambuch (49) who criticizes Löchel for not addressing the key roles that women do play in the novel.

56 The American protagonists and approach to governing and decision-making resemble the (imagined) George W. Bush government. The president in the novel therefore takes after Bush, Li after Condoleezza Rice, and the Americans' strategy evokes the War on Terror after 2001 (cf. Gulddal "'The One Great Hyperpower;'" *Anti-Americanism*; also cf. Dayioğlu-Yücel 65). The final conflict between the American protagonists and other members of the taskforce essentially presents more of a showdown than the final encounter between the yrr and Weaver.

57 Cf. Gulddal's *Anti-Americanism* as well. Gulddal further substantiates his argument by noting that "Schätzing never explicitly compares the US to Nazi Germany, but when he lets his American characters dream of mass extermination and world domination, the comparison nevertheless seems to be lurking just below the surface" ("'The One Great Hyperpower'" 688). Cf. also Diner's chapter on "USA-SA-SS".

58 "Und dann ist der einzige Vorwurf, den man diesem Buch machen kann, ausgerechnet der, den Europäer sonst bevorzugt Amerikanern machen: ideologisch zu einfach gestrickt zu sein."

59 "penetranten Antiamerikanismus;" "[d]iese Haltung ist Teil einer Abgrenzungsstrategie in einer literarischen Gattung, die seit langem von amerikanischen Autoren dominiert wird; und sie ist im übrigen ziemlich widersprüchlich, weil Schätzings leicht entflammbare Phantasie ganz unverkennbar von Hollywoods Desasterszenarien befeuert ist."

60 "klassische Spannungsroman … ein US-produzierter Literaturersatz für Technokraten."

61 "Schrott;" Cf. also Diner who demonstrates how questions of culture and authenticity have been a distinct characteristic of German anti-Americanism.

62 "Patriotic Europeans Against the Islamization of the West/Occident;" "Patriotic Europeans Against the Americanization of the West/Occident."

63 "Schätzings deutsches Öko-Weltgenesungswesen;" "[i]m Kampf um eine profitable deutsche Nationalkultur."

64 Gulddal terms this worldview "Gaian view" in his book: "nature constitutes an organic whole" (*Anti-Americanism* 187).

65 Dürbeck's analysis is moreover reflected in the fact that *Der Schwarm* has been used to teach about ecological and environmental issues in general (cf. Melin; "Das Meer schlägt zurück" by *Planet Erde*, which offers further links about the novel's scientific topics, and is sponsored by the Bundesministerium für Bildung und Forschung (Federal Ministry of Education and Research)). Apparently, the book's factual engagement even saved lives: "Er [Schätzing] habe mindestens 60 Leser getroffen, die sich dank des Wissens aus seinem Buch an Weihnachten 2004 in Asien rechtzeitig vor der Flutwelle in Sicherheit bringen konnten ... Ein österreichischer Leser habe ihm berichtet, dass er an einem Strand in Südostasien gerade die Passage über sich zurückziehende Wassermassen las, die sich zu einer Riesenwelle formieren, als sich vor seinen Augen das dramatische Naturschauspiel tatsächlich abspielte. Mit lauten Schreien habe der Leser mehrere andere Urlauber am Strand gewarnt und ihnen so das Leben retten können" ("[According to Schätzing,] he met at least 60 readers who were able to seek shelter in time from the tidal wave in Asia in 2004 because of the information provided in his book ... An Austrian reader told him that he was just reading the passage about receding tides, which then turn into a tidal wave, at a beach in Southeast Asia when this natural spectacle indeed happened in front of his own eyes. Screaming loudly, the reader then alerted other tourists on the beach, which saved their lives;" "'Mein Buch rettete viele Menschen vor dem Tsunami;'" cf. Strittmatter). The way the novel then conveyed scientific and environmental knowledge to its readers echoes studies on the impact Roland Emmerich's 2004 blockbuster *The Day After Tomorrow* had on moviegoers: the film influenced their environmental perception (cf. Reusswig; Reusswig et al.; Leiserowitz). As Leiserowitz suggests, the knowledge people drew from the film also depended on culturally specific reasons for seeing the film in the first place: Germans seemed to have been interested in watching the movie because of its environmental themes, while Americans seem to have been drawn to the cinema because of the film's status as a disaster summer blockbuster (cf. 43).

66 Schätzing's own words substantiate Dürbeck's analysis: in an interview in 2012, he emphasized that human actions accelerate climate change, which was not necessarily caused by humans. Most importantly, humans, as part of nature, have to develop strategies to live with the changing climate (cf. Frank and Scholz). These statements essentially capture the novel's main plot and message, and, by implication, suggest that globalization, like climate change, requires an adequate response to live with its effects.

67 "[ö]kologisches Verstehen … als bottom-up-Prozess mit einer Anti-Establishment-Komponente."

68 The Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety) and the Umweltbundesamt (Federal Agency for

the Environment) have conducted these surveys every two years since 1996. They demonstrate that the environment has remained a main concern for Germans over the years (cf. "Umweltbewusstsein und Umweltverhalten;" cf. Kuckartz and Rheingans-Heintze, *Trends im Umweltbewusstsein* 18).

69 "Ferner glaubt eine Mehrheit von jeweils 58%, dass die Grenzen des Wachstums erreicht sind und wir auf eine Umweltkatastrophe zusteuern, wenn wir so weiter machen wie bisher."

70 Cf. apocalypse as "Leitmetapher" in Dürbeck and Feindt 224.

71 "Ein Grund dafür, [sic] wird in der andauernden Beschäftigung deutscher Autoren mit innerdeutschen historischen Krisen vermutet."

72 Cf. Deniz Göktürk's et al. *Transit Deutschland: Debatten zu Nation und Migration*, which documents the prevalence of this question in post-war Germany in depth, as well as the following chapter.

73 "Die Annäherung an die Yrr geraten zu einem Lehrstück für interkulturelle Sensibilisierung."

74 "[k]ritisches Bewusstsein … im Umgang mit dem 'Fremden.'"

75 "Wir [Menschen] tun uns nun mal schwer mit der Vorstellung, dass unsere Werte nicht auch die Werte anderer sein sollen und dass deren Vorstellungen von Gut und Böse vielleicht nicht den unseren entsprechen könnten. Dafür müssen Sie nicht mal in den Weltraum horchen. Jede Nation, jede menschliche Kultur hat ihre eigenen Aliens vor der Haustür, nämlich immer die jenseits der Grenze (Schätzing 2004: 673)" (Dayıoğlu-Yücel 65). This passage has, for instance, also been used as a motivating motto by Crossculture Academy, a business specialized in teaching intercultural communication and competence.

76 Gulddal seems to identify Rubin as American (*Anti-Americanism* 186): the book explains that he works for the American protagonists.

77 Cf., for instance, Varnhorn 131 and Wellnitz (95-96).

78 "[S]o ist der Jude für die merkwürdigen Personen des alten Testamentes mit Vorliebe um so viel mehr eingenommen, weil er in diesen seine Vorfahren und Blutsverwandte findet. Daher entlehnen die Juden fast alle ihre Namen aus der Bibel;" "Eben dieses kann vielleicht vieles mit beigetragen haben, daß die Christen so selten Namen aus dem alten Testamente, und dagegen so viele Namen aus dem Cirkel der Heiligen genommen haben, um sich von den Juden, dieser von ihnen so sehr gehaßten und gedrückten Nation, auch dadurch zu unterscheiden."

79 "eine ganze Kartographie antisemitisch besetzter Namen."

80 "amerikanischer Correspondent in ein[em] Bankhaus." In the context of the earlier discussion of anti-Americanism in *Der Schwarm*, it is noteworthy that Fontane's Ruben eventually "alles Amerikanische … ab[…]streift" ("stripped himself of everything American").

81 While "Mick" is a variant of the name "Michael," it sounds less formal, more familiar, as well as incomplete. It is moreover used as an ethnic slur for an Irish person.

82 Central Council of Jews in Germany.

83 In the context of the Holocaust and the Nazis' "final solution," the word choice of "solution" appears particularly ill-chosen. The German edition also uses the word "Pheromonlösung" (926); "Final solution" means "Endlösung" in German.

84 The fact that the 2017 Wahl-O-Mat of the Bundeszentrale für Bildung (Federal Agency for Civic Education; bpb) featured this particular question demonstrates the extent to which the political climate has shifted in recent years, namely in ways that allow for questioning the place the Holocaust has occupied in German contemporary memory culture.

85 "Indians;" In the following discussion, "Indianer" will be used to stress the imaginative quality of this relationship.

86 "Indianer" were popular in both West and East Germany. In both countries, they served as a means to reflect on the two political systems and to imagine a German national collective (cf., for instance, Grabbe; Kramer). Cf. further Siegrid Deutschlander for an examination of German tourists visiting aboriginal places and events in Canada; Gilders for a general overview of this phenomenon as well as Lutz *"Indianer" und "Native Americans"*; Calloway et al. See also Penny's insightful "Elusive Authenticity" for an in-depth discussion of the meaning of "authentic Indian" in German culture. It is also noteworthy that the German environmental movement turned to Native Americans for inspiration and counselling (cf. Lutz, "German Indianthusiasm"179).

87 "Wahlverwandtschaften"

88 The equation between Germans and "Indianer" has traditionally been facilitated via reference to Germanic tribes and Romantic efforts to construct a German nation and identity. According to Lutz, "the dual stereotype of the noble yet bloodthirsty[, according to Romans, Germanic] savage" was linked to "the dual stereotype of the Indian as a 'red gentleman' and a 'bloodthirsty red devil'" ("German Indianthusiasm" 173).

89 The novel explains his education as a consequence of being adopted by white parents, although intelligence and, moreover, wisdom characterize the German "Indianer" cliché traditionally. Schätzing's eco-thriller, however,

stands out as it, instead of envisioning past times, imagines a present-day "Indianer" who struggles living in modern Canada (cf. Lutz, "German Indianthusiasm" 168). Anawak's task is to realize that it is possible to honor his heritage in a modern world: "The world was returning part of what it had taken, and giving them a new outlook, in which ancient traditions took their place alongside a western lifestyle" (535). His struggle with his Inuit heritage is often explicitly addressed via his personal animosity with environmentalist Jack O'Bannon, known as "Greywolf." Greywolf is of Irish and native origin, and solves his own identity crisis by wholeheartedly embracing and visibly performing his "Indianer" origins. Moreover, the impeding environmental catastrophe the taskforce is attempting to prevent provides other protagonists with ample opportunities to find themselves (e.g. Weaver and Johanson).

90 Schätzing attributes the saying to the Nuu-chab-nulth tribe (Vancouver Island). It means "everything is one," "everything is connected." For the Nuu-chab-nulth tribe, this philosophy applies to everyday life, as well as a variety of specific areas, such as the management of the environment, or approaches in health care.

91 Alternative for Germany.

92 "Herstellung von Mischvölkern;" "einfach nicht zu ertragen [sei]."

93 "Germany abolishes itself. How we are jeopardizing our country."

94 "Tatsächlich ist das Elementare bei Sarrazin das Biologische. Kulturell ist bei ihm ein Deckwort für genetisch. Hat man dies begriffen, liest man Sarrazins Sorge um die 'kulturelle Identität', die 'kulturelle Substanz' und den 'Volkscharakter' Deutschlands mit anderen, den richtigen biologischen Augen. … Das ganze Buch liest sich wie ein antimuslimisches Dossier auf genetischer Grundlage. … 'Deutschland schafft sich ab' erzählt die Untergangsgeschichte einer Nation."

95 Sarrazin echoes Johanson's and Li's discussion when arguing: "Setzt man voraus, dass die Menschen – abgesehen von genetisch bedingten Unterschieden in Intelligenz und Temperament – mit grundsätzlich ähnlichen Dispositionen zum Leben geboren werden, dann sind die Möglichkeiten, Institutionen und Systeme zu gestalten, nicht schrankenlos. Mit Edward O. Wilson kann man davon ausgehen, dass die biologische Evolution dem Menschen eine angeborene Disposition und Verhaltensbreite mitgegeben hat, die sich nur langsam auf dem Wege der weiteren *biologischen Evolution* ändert, dass aber innerhalb dieses der menschlichen Natur von der Biologie gesetzten Rahmens eine sehr variationsreiche *kulturelle Evolution* stattgefunden hat und weiter stattfinden wird" ("If one postulates that humans – aside from genetically caused differences in intelligence and temperament – are born with essentially similar dispositions to live, there are limits on the potential to shape institutions and systems. Based on Edward O. Wilson, one can assume that biological evolution provided humans with an inherent disposition and a range of behaviours, which are only changing gradually via the continuous *biological evolution* but that, within the frame biology provided human nature, a very diverse *cultural evolution* has taken place and continues to do so"; 24). He also outlines the argument that religiousness is a genetically inheritable trait (cf. 363).

96 "ein deutsches Volksmärchen."

97 "unser aller Blutsbruder."

98 "Jede Generation hat ihren Winnetou."

99 "Germans with a migration background."

100 "das nicht nur die Struktur eines gegebenen Wissensstands exploriert, sondern auch seine Voraussetzungen, seine Umsetzbarkeit, Folgen und Pathologien mit bedenken kann."

101 The vast majority of reviewers and also scholars commented on Schätzing's filmic writing style, often concluding it diminishes the quality of writing and his text.

102 Symptomatic of this trend is Angela Merkel's response to a question about her policies in regard to the 2015 "Refugee Crisis" during the 2017 Federal Election debate: Merkel states that she does not regret her decision "als es um Flüchtlinge, um Menschen ging" ("when refugees, humans, were at stake"; "TV-Duell").

# Chapter Three

## What is Human?
## Netflix's *Sense8* and the Reproduction of the Sensate Experience

### Introduction

In early June 2017, a group of scientists announced that Homo sapiens was hundred-thousand of years older than previously thought: instead of 195,000 years, the researchers proved humans already populated the earth 300,000 years ago.[1] The researchers concluded from recently discovered fossils in Morocco that Homo sapiens, instead of originating in one central location in Africa, existed in various regions across the entire African continent. While the recovered fossils suggest that these humans evolved as a "network of groups spread across the continent" (Zimmer), and apparently resembled contemporary humans quite closely in appearance, their brains had not yet developed into the rounder shape of later Homo sapiens. The discovery, the New York Times declared, for instance, "alter[s the] history of our species" (Zimmer).

An altered history of Homo sapiens is also the premise of the science-fiction show *Sense8*. The 2015 Netflix original series imagines the existence of another kind of human beings, who evolved alongside Homo sapiens but whose brain's basic architecture differs slightly from the former's. These humans, named "Homo sensorium" or "sensates," distinguish themselves by possessing the biological, cerebral ability to mentally and emotionally connect with each other. I argue in the following discussion that *Sense8* reproduces the sensate experience of its fictional universe in its global audience via the series' particular blend of art and technology.

### The Homo Cinematicus: Walter Benjamin and the Technological Reproducibility of the Cinema

Before taking a close look at the construction of the Homo sensorium in Netflix's *Sense8*, this chapter first turns to Walter Benjamin's influential essay on the technological reproducibility of art. Benjamin's persuasive thoughts on the inherently reproductive and technological nature of cinema serve here as a means to raise questions about the meaning of the Homo sensorium and the potentially far-reaching ramifications arising from its conceptualization and creation.

According to Benjamin, art has always been reproducible.[2] Benjamin claims, however, that the current technological and economic means of reproduction are of a different nature than earlier reproductive methods. They, therefore, drastically transform the quality of both the non-reproduced and reproduced work of art, as well as the manner in which those artworks are perceived. The catalyst for Benjamin's motivation in examining art and its relationship to reproduction originated in the question of how photography and film change the way humans perceive art. In turn, this also meant asking how a work of art differed when it had been created via such reproductive technologies. In other words, Benjamin explores in his compelling essay how both humans and art have undergone fundamental transformations as a result of technological reproduction, and how theses changes also arise from and affect the mutual relationship between art and humanity.

As explained in the analysis on screening test tube babies in German silent cinema, Benjamin identifies the absence of an "aura" as a key characteristic of a reproduced artwork. "Aura" describes the physical, temporal, and, hence, historical singularity of a work of art, which also translates into sharing a unique experience, a kind of palpable exchange, that takes place while looking at what Benjamin further defines as original and authentic artwork. Significantly, it is not only the case that a replica lacks an aura but also that the way the observer takes in the artwork has qualitatively been altered as a result of its reproductive nature. "The way in which human perception is organized, the medium in which it occurs, is conditioned not only by nature but by history," Benjamin therefore concludes ("Work of Art" 23). He further argues that these transformations, which stem from the technological as well as economic ability to reproduce artwork en masse, have far-reaching social and cultural consequences.

These ramifications find, for instance, expression in what Benjamin identifies as a change in the exchange that occurs between the artwork and its beholder. For Benjamin, the way the artwork is being perceived shifts from a contemplative to a distracted mode of perception. The sensory presence of an original artwork allows for an act of viewing that Benjamin labels contemplative, while technologically reproduced art elicits distraction in human senses. Contemplation suggests a beholding of the work of art in a concentrated, calm manner, which entails the absorption of the viewer by the artwork. Distraction, in contrast, means that a reproduced art leaves the beholder no room to pause and observe. When experiencing a work of art in the distracted mode, it thus is the audience who absorbs the work of art.

When comparing authentic and reproduced art, along with their respective modes of perception of contemplation and distraction, Benjamin furthermore notes that the audience itself differs: technologically reproduced art is aimed at and consumed by the masses, while non-reproduced art was traditionally created for ritualistic purposes and, if at all, gazed at by selected individuals.[3] Of importance is therefore not any longer the cult value of the work of art but rather its exhibition value. The latter is defined by an artwork's ability to be perceived by as many people as possible at the same time. Consequently, the advent of technological reproduction and the rise of the masses have resulted in works of art that are judged based on sameness, rather than uniqueness. Technologically reproducible works of art are thus inherently tied to the economic circumstances of their production and, in addition, have an intrinsic economic function, which also establishes the masses as mass consumers of art.

For Benjamin, film is therefore the epitome of a technologically reproduced work of art and of a distracted mode of perception because it is "entirely determined by its reproducibility" ("Work of Art" 28). Cinematic artworks are, in a nutshell, simply non-existent—even unimaginable—if it were not for technology and its reproducible capabilities. When comparing film to theater, Benjamin illustrates how cinematic reproductive technologies penetrate reality to create a technologically assembled, aura-less work of art that generates as well as demands distraction from its mass audience. The inherently technologically reproductive nature of film comes, for example, about by the film actor acting for the camera, instead of for a (live) audience. It is to be found in the manual, yet mechanical creation of skillfully and purposefully (re)produced and (re)organized images, which are ultimately, though belatedly, transported to the audience via screening equipment. The mass audience might see reality, since film, as Benjamin acknowledges, has the power to portray it. More importantly, they might, however, view images depicting the "optical unconscious," aspects of reality that were only brought to light because of the camera, which directs the audience's perception toward matters not visible to the naked eye ("History of

Photography" 7). Similarly, by offering entertaining images in form of speed and shock—imagery that resembles modern, urban life, film requires viewers, who see themselves reflected in art for the first time, to adopt the mode of the distracted gaze to make sense of modern existence and, in fact, cinematic art while nevertheless providing audiences distraction of this life in the first place.

One way to understand Benjamin's essay on the technologically reproductive and reproducible nature of cinema and its effect on human apperception, then, is to view it as a form of *Menschenbildung*. By looking at the transformations of art and its modes of perception, Benjamin not only identifies a new form of art but also a different type of human. This new type of human being emerges as a consequence of humankind's exposure to reproductive technologies and, especially, cinematic artworks. In other words, Benjamin identifies and defines the homo cinematicus. The term of the "homo cinematicus" was coined by Wilhelm Stapel in 1919, in an opinion piece by the same title. According to Stapel, the homo cinematicus was born as a result of—what he believed to be—the devastating effects cinema had on moviegoers' mental state. Stapel was of the opinion that, "when someone goes to the cinema one, two, or three times a week, he suffers psychic damage from the *form* of the presentations alone, regardless of their content" (qtd. in Kaes et al. 242). As Stapel further explains, the adaptation to the "flashing, fluttering, and twitching images of the flickering screen," a process which seems to be addictive in nature,[4] causes not only mental instability but also the breaking down of moral standards and, thus, of a moral core (qtd. in Kaes et al. 242–243). For Stapel,

> [t]he consequence of all of this is the following: under the influence of cinema, a new psychic type is emerging among the people. A human type, which only flutteringly "thinks" in rough, general ideas, which allows itself to be ceaselessly carried from impression to impression, which is no longer *capable* of making clear and convincing judgments. A human type that already did enough damage during the revolution, and that, with every new generation exposed to the psychic attrition caused by the cinema, will grow and make its mark on culture (including political culture). *The cinema is constructing a new human type, inferior in both its intellectual and moral capacities*: the *homo cinematicus*. (qtd. in Kaes et al. 243)

Although Benjamin does not use the term "homo cinematicus," his description of the transformations taking place in both the cinematic work of art and its beholder echoes Stapel's analysis of cinema's extensive, disastrous effects. After all, Stapel's speaking of the changed nature of "*thinking*" and the loss of an earlier, "nobler culture" is reflected in Benjamin's thoughts on contemplation and distraction but also in the presence or absence of an artwork's aura (qtd. in Kaes et al. 242). Both authors moreover attribute a revolutionary social power to the cinema with its newly created homo cinematicus. The key difference between Stapel and Benjamin is, however, that the former was so concerned about the negative effects of cinematic technology that he believed people had to abstain from going to the movies. While Stapel, finding no positive attributes in the reproductive technology of film, and only catastrophic potential in its ability to cause social upheaval, ultimately advocated a radical abolishment of the cinema, Benjamin came to quite different—more balanced and, hence, more fruitful—conclusions about the nature and function of cinematic art and its users.[5]

By putting into dialogue Stapel's and Benjamin's analyses on cinema's transformative powers, Stapel's definition of the "homo cinematicus" sheds its original, entirely negative connotation.[6] I argue here that the homo cinematicus, in the context of Benjamin's essay, not only

describes the changes the cinematic medium has on its beholders but rather also captures the nature of the cinematic image itself. The idea of the homo cinematicus moreover allows bringing together the ramifications cinema has on both biological and cultural processes and manifestations in one cultural site. As another incarnation of an *artificial alien*, the homo cinematicus is also related to the Homunculi children, both the sciences' as well as cinema's, examined in Chapter Two. In the context of this discussion, the homo cinematicus serves as a starting point for exploring the nature and function of *Sense8*'s Homo sensorium and its relationship to *Menschenbildung* and the reproductive imagination.

## What is/are *Sense8*/Sensates?: The Genus of Homo Sensorium

Before further thinking through the implications of Benjamin's thoughts on the reproductive, technological nature of cinema in the context of *Sense8*, this discussion takes first a closer look at the Netflix original series itself.

On June 5, 2015, Netflix released *Sense8*, which is created and written by the creators of *The Matrix-Trilogy* (1999; 2003), Lilly and Lana Wachowski, and J. Michael Straczynski, best known for creating the television series *Babylon 5* (1994–1998). The series follows the lives of eight strangers living in different parts of the world: this group of eight people, sharing August 8 as their birthday, experience a sudden mental and emotional connection with each other. American Will Gorski, a second-generation cop from Chicago, unexpectedly shares a telepathic bond with Nomi Marks, a transgender political blogger and hacktivist from San Francisco; with Lito Rodriguez, a closeted gay actor smitten with his boyfriend from Mexico City; with the Nairobian matatu bus driver and perpetual optimist Capheus "Van Damn" Onyango, who cares for his gravely ill mother; with Sun Bak, a martial artist who works as a chief financial officer and vice president at her father's company in Seoul; with the Mumbai chemist Kala Dandekar, a Hindu who has doubts about her upcoming marriage; with the depressed Riley Blue, an Icelandic DJ living in London and Will's soon-to-be girlfriend; and with Russian German Wolfgang Bogdanow, a Berlin safe-cracker played by German actor Max Riemelt.[7] As a result of the mental connection all of the eight abruptly share with each other, they are suddenly able to tap into each other's emotions, thoughts, knowledge, and skills.

The first season, made up of twelve episodes, shows how this group of eight people gradually learns that they are so-called "sensates," or "Homo sensorium," a naturally evolved species of the genus of Homo sapiens.[8] Via a special part of their brains, the "psycelium,"[9] sensates are mentally and emotionally linked with each other, without having to be in the same geographical location. This bond, which, via the "psycelium," facilitates telepathic communication, is particularly close and intense within a specific group of people, a so-called "cluster." *Sense8*, in a nutshell, tells the story of how this collective cluster of eight sensates discovers their slowly intensifying link, and how these formerly eight strangers increasingly rely on each other and their connection to navigate their personal lives, as well as escape from the clutches of a shadowy organization, the Biologic Preservation Organization (BPO), which persecutes and hunts sensates. The second season, which started off with a two-hour Christmas special, has the original cluster meeting up with other sensates, and narrates the eight's continuous struggle to evade getting caught by the secretive BPO and its officials, primarily the even more mysterious sensate known as Mr. Whispers.[10] In both of its at the moment existing seasons, *Sense8* featured German director Tom

Tykwer, internationally best known for *Lola rennt* (1998) and *Cloud Atlas* (2012), which he directed together with the Wachowskis, as a composer to the series as well as a director for the Nairobi and Berlin locations.[11] Via the August 8 cluster, *Sense8* explores a variety of human themes from a globalized and technologized, yet individual and cultural-specific perspective, such as familial and romantic love, sexual orientations and gender identities, individual and collective relationships, personal desires and societal expectations, religious and atheistic beliefs, or individual and collective memory. These diverse issues are tied together by a common message: the significance and importance of emotions and empathy—the sensate experience—for the unfolding of the human existence.

According to the show's scientific terminology, sensates, which approximately denotes "perceptible or perceived by the senses" ("sensate"), are Homo sensorium, or vice versa. To reiterate, Homo sensorium are humans who carry a slight genetic mutation, the aforementioned "psycelium." While one is born with this particular biological feature, this genetic idiosyncrasy, which is located in the brain, must be activated. The show, as demonstrated below in further detail, describes this process in terms of (re)birth. Once stimulated, the psycelium, which can be identified via magnetic resonance imaging (MRI), enables the telepathic connections that link sensates together. As *Sense8* is a play on the word "sensate," which possesses the Latin root word for "sens," "to feel," as well as the number eight in reference to the eight members of the cluster born at exactly the same time on August 8, the word "psycelium" conjures the term "mycelium." According to the *Oxford English Dictionary*, "mycelium" is "[t]he vegetative tissue (thallus) of a fungus, typically consisting of a network of fine [white] filaments (hyphae)" ("mycelium"). Mycelium, which more often than not reproduce asexually, branch out in and across soil, often in fungal colonies. Furthermore, the prefix "psy" in "psycelium" refers to "psych," meaning "mind" and "soul." The word "psycelium" thus captures the different meanings of both of these terms, and emphasizes the biological, localized, and tangible nature of being sensate. Being Homo sensorium, in the words of the fellow sensate and mentor of the August 8 cluster, Jonas Maliki,[12] means that the mind "expand[s]" into a network of minds. This expansion is rhizomatic in nature, and is described as "limbic resonance," a feeling of an emotional, wavelike connection. This mental, emotional, and physical link enables multi-layered communication, which primarily promotes understanding and empathy.

While the series's showrunners imagined the psycelium and the sensate experience, the idea of communicating brain to brain is indeed a concept that is also explored by scientists. One study, for example,

> demonstrated the feasibility of direct brain-to-brain communication in human subjects, with special care taken to ensure the non-participation of sensory or motor systems in the exchange of information … Streams of pseudo-random bits representing the words "*hola*" and "*ciao*" were successfully transmitted mind-to-mind between human subjects separated by a great distance, with a negligible probability of this happening by chance. (4–5)

In comparison with the immediate, instantaneous experience of the sensate bond, this particular experiment of brain-to-brain communication was facilitated via technological mediators, and, respectively, took quite a while to be transmitted. Nevertheless, the authors of the study are of the belief that such "hyperinteraction technologies" "will create novel possibilities for human interrelation with broad social implications that will require new ethical and legislative responses" (1; 5). In her fascinating analysis of the "neurological reality" of *Sense8*, Sulagna Misra, who also

briefly refers to the previously cited research project on engineering telepathy, moreover draws a comparison between the sensate cluster connection—further discussed below—and the actual experience of multiple personality disorder.

## Birth on a Global and Collective Scale

While being a Homo sensorium then is a genetic predisposition, this hereditary trait must be activated, a process that resembles—and is denoted as—giving birth and includes a short period in which the mental and emotional bond between members of a cluster gradually intensifies. The series, in fact, begins with this initial step of (re)birth. In an abandoned, run-down church, Angelica Turing[13], also a sensate, births the August 8 cluster by connecting mentally—in the following order—with Lito, Riley, Sun, Wolfgang, Will, Kala, Capheus, and Nomi. On the one hand, this awakening of sensate organs and abilities is visualized as a form of labour: Angelica, clad in a short, ruffled white dress, pants, groans, and squirms in visible, sweaty agony on a dirty mattress, her partner, namely Jonas, sitting behind her in a supportive embrace.[14] The physical aspect of this labouring culminates in a final violent full-body tremor, which ends in Angelica sitting up abruptly, exclaiming in a loud whisper: "I see them."[15] While Angelica, with a wide-eyed and amazed expression on her face, is uttering this statement, the hand-held camera slowly pans from showing her face at a slight angle to the right side of her head until capturing more of an alongside profile shot. This shot, then, sets up a position for the audience to also observe what Angelica sees. The following scene depicts in slow motion a polished silver gun being drawn by a sturdy hand from a gun holster being worn over black pants, drops of blood falling down, before cutting to the next image of the back of a dark- and short-haired man wearing a white, ruffled shirt and walking purposefully inside of what appears to be a church. The next shot briefly shows a man's—Lito's—determined face before switching to Riley who is smoking while leaning against a building's balustrade on a rooftop during twilight hours.

In other words, birthing and becoming sensate involves the act of looking, being seen, and also staring back. Accordingly, the following sequence introduces the other seven sensates respectively by always showing them first going about their mundane, daily activities in the show's present moment. In the next step, the sensates, however, look back at Angelica who suddenly appears in front of them. Wolfgang, looking puzzled, sees her first, pausing in his dancing,[16] while Will's police car is forced to stop in front of Angelica unexpectedly sitting in the middle of the street. In Nomi's case, Angelica, standing off to the left and behind the hacktivist, is initially reflected in a full-length, stand-alone mirror, before the blogger, only clad in a towel, finds herself as the first of the eight sensates in the decrepit church, where Angelica gives birth.

This birth of sensate abilities, an asexual reproduction, initiates the process of becoming a cluster. While the creators of *Sense8* thus flesh out the individual lives of Nomi, Will, Lito, Capheus, Sun, Kala, Riley, and Wolfgang in colourful detail, the show primarily portrays how the gradually strengthening mental connection, which manifests itself, among other things, via migraines, transforms these eight individuals into a new, collective "we." "I Am Also a We," the title of the second episode of the first season aptly summarizes this process of collectivization.[17] The telepathic link ultimately allows sensates to do more than simply exchange thoughts: sensates' mental and emotional bond, instead, facilitates the instant experience of each other's life, emotions, knowledge, skills, and memories. Thus, Kala believes it to be raining and thundering one morning

in Mumbai, though the thunderstorm she hears actually happens in Berlin; Will, sleeping in his Chicago apartment, hears loud music, which originates at one of Riley's London concerts; and Lito, unexpectedly, experiences Sun's hormonal mood swings and menstrual abdominal pain.

Furthermore, the sensate bond, which is strongest among members of the same cluster, enables sensates to teleport to each other's location without actually leaving one's own, a mental and emotional transaction called "visiting." Riley therefore finds herself in Will's place talking to his police partner; Sun sees the chicken that Capheus received as payment for a bus ride appear on her office desk; and Wolfgang ultimately steps in for Lito to beat up the actor's blackmailer. "Visiting" is indeed rendered visible and visually as a form of stepping in, or stepping in front of the camera. In the show's accompanying documentary, *Sense8: Creating the World*, Miguel Ángel Silvestre, who portrays Lito, explains that "[t]he way they're [The Wachowskis] doing the [sensate] connection is not by post-production. It's in the moment. It's very choreographed. So, they normally, they use a piece of wall, they use a shadow, they use things to make us hide and suddenly appear." Filming the act of visiting thus involves diverse blocking techniques, physical swaps via bending or ducking, and, indeed, stepping aside or sliding into a scene.

These techniques were also used in one of the most memorable parts of the series, namely an almost ten minutes long, speechless, slow-motion montage flashing back to the birth of each of the eight sensates and culminating in Riley giving birth to her own daughter. While this segment, which featured live births and even a vaginal crowning shot,[18] "was like nothing else on television, indeed" (Kaiser), the montage has not only a crucial function in the series' plot but also for the discussion further below on the creation of the "Homo sensorium" outside of *Sense8*'s universe. The fact that this sequence of nine births is staged as memory, yet experienced physically and emotionally by all eight sensates in the show's present moment matters moreover greatly. The collective remembering of being born takes place at the Harpa concert hall in Reykjavík, Iceland, on July 4, when Riley's father, Gunnar,[19] performs Ludwig van Beethoven's "Piano Concerto No. 5 in E-flat Major, Op. 73 'Emperor': I. Allegro" on the piano, together with an entire orchestra. The sequence of births is preceded with Will and his father celebrating Independence Day by watching fireworks on a boat at night in Chicago; Nomi and her girlfriend Amanita Caplan[20] making passionate, orgasmic love on their bed in their apartment in San Francisco; and an emotional, reconciliatory, and life-changing declaration of love between Lito and his boyfriend, Hernando Fuentes, in Mexico.[21] In other words, the montage of nine births is lead in by themes of familial and national belonging, physical and emotional love between non-heteronormative couples as well as of freedom, individuality, and joy.

The initial moments of the performance of Beethoven's composition are predominantly transmitted by capturing impressions of the aesthetically impressive Harpa and its audience and close-ups of Riley's father playing the piano as well as of some other members of the orchestra and their instruments before closing in on Riley taking a seat and listening intensely in the audience.[22] The instance the music switches from solo piano back to the entire orchestra signals the moment when all eight sensates find themselves in one place at once for the first time. This collective coming and being together is visualized via a rotation of close-ups of each sensate, who alternately sit, equally intensively listening, in Riley's place. The montage of nine births, thus, signifies the completion of *becoming* sensate and of the birth of this specific cluster of former strangers from across the world who initially, and unknowingly, only share the same birthday. The montage of births is therefore in itself a scene of a birth but also of a reproduction.

Once the presence of the eight sensates at the concert is established, Riley, triggered by her father's playing, begins to remember her own birth. The subsequent sequence then flashes back—in the following order—to Riley's, Will's, Kala's, Lito's, Sun's, Nomi's, Wolfgang's, and Capheus's births before showing Riley in labour.[23] While the circumstances and surroundings of these nine births differ greatly, and although the sensates moreover show different, though always highly emotional reactions to witnessing their own births, being born, here, turns into a universal, unifying, and nevertheless cultural-specific, individual experience. This notion translates into the idea that the immediate environment of one's birth shapes one's personality as well as later path in life profoundly, which, most notably, ties this segment narratively and visually together.

In Riley's case, her father's recital of Beethoven at Harpa presents a kind of repeat performance. While Riley's mother gave birth on a living room couch, a young Gunnar played the piano away in a classroom and transmitted his music via a black and red landline telephone, which, as a close-up prominently shows, was placed on a chair beside the instrument. The most memorable but also significant shot of the scene is the moment when a friend present at the birth holds the telephone receiver, which broadcasts Gunnar's play, in front of the bloody, crowning baby. Riley's coming into the world to her father playing ultimately translates into her own love for music and career as a DJ. Will's choice to become a second-generation police officer is foreshadowed by having been born, amidst burning flares in the middle of the night, on the backseat of his father's police cruiser. While the urgency of Will's birth is contrasted with his generally calm demeanour in intense situations, Kala's unswerving faith is captured with a cut from Will looking up as if to heaven to a close-up of a statue of the elephant-headed Hindu god Ganesha that marks the opening of her birth memories. As the god of beginnings, transitions, and "integrator of opposites" (Brown 5), Ganesha symbolizes not only Kala's seemingly oppositional character—she is a believer and a scientist, and, despite her responsible, polite, and considerate nature, falls in love with the "bad boy" Wolfgang—but embodies also the cluster's overall diversity with its contradicting personalities and life experiences, and therefore acts as a suitable kind of spiritual guardian. Kala's birth scene puts moreover emphasis on environmental factors and their relationship to humans' everyday life and cultural manifestations: images of rain and water precede shots of her labouring mother, establishing a clear connection to her love interest Wolfgang's predilection for water as well as evoking India's monsoon season. The seed for Lito's dramatic personality and vocation as an actor was, as his flashback reveals, planted in his entire family's burning passion for watching movies and television series, a familial love affair that even played out during Lito's birth, which takes place among several family members in front of the television in the living room. While Lito's acting talent is ultimately a skill that, as a form of self-defence, becomes vital to the cluster's survival, his love for film and television, moreover, points to the crucial function the arts hold in the show—and, by implication, in humanity's evolution. The circumstance that Sun was born in the middle of the day in front of one of the graves lining the Seoul National Cemetery foretells her respect for and commitment to her family, her parents' early, tragic deaths, and her rather grave, stoic personality and willingness to self-sacrifice. The inclusion of a memorial site in this montage of birth memories moreover points to the significance and universality of memorialized, institutionalized, and localized commemoration practices. This theme of institutionalization is carried forward into Nomi's memory of her birth, which took place as a Caesarean section in a high-tech hospital room. Nomi's later strained relationship with her mother who mouths her daughter's first name "Michael" appears to be foreshadowed—perhaps even grounded—in the sterility of the medical equipment, the absence of other family members, and lack of emotions. The medical environment of her birth moreover points to the hormone

therapy which allows Nomi to live as a trans woman. Wolfgang's already mentioned affinity for water, which is, for instance, visualized via rainy days in Berlin and several scenes depicting him swimming, is explained by the circumstance of his mother having chosen a water birth for the delivery of her son. Capheus's memories stand in particular contrast to Nomi's surgical birth, as they show his mother, supported by two women, kneeling on the floor while in labour, lanterns illuminating an otherwise dark hut. A close-up of one of the women's faces, equally grimaced in shared agony and motivating support, notably highlights once more the vital role women have in matters of reproduction, one which is, however, traditionally sidelined in fictional narratives of creation and even birth in favour of male agency.[24] Throughout the show, Capheus, known for his upbeat outlook on life, stands out for his loving, caring relationship with his mother and ability to easily share his emotions with other female sensates. After switching back from Capheus to the orchestra and, then, to Riley, this birth montage concludes with the latter remembering how she gave birth to her daughter in a crashed car, her dead husband beside her, during one of Iceland's harsh winter storms, a traumatic memory that forces Riley, blood streaming out of her nose, to faint.[25]

While *Sense8*'s elaborate birthing scenes are key to establishing the evolutionary history of the Homo sensorium and sensate connections, they, however, suggest a more in-depth, multifaceted fascination with and investment in reproductive processes. Although the montage of births, for instance, stands out for emphasizing the naturalness and physicality of reproduction and, indeed, existence, the segment is equally characterized by artificiality and artifice.[26] I therefore argue that *Sense8*—via the reproduction of the Homo sensorium—negotiates how reproduction, distribution, and circulation of art are vital—indeed, constitutive—parts of the human experience. The series, in other words, demonstrates how art—the technologized, reproduction of humans on screen—is an intrinsic process of *Menschenbildung*.

The function of art and its relationship to the sensate experience is skillfully captured and demonstrated by two particular instances, which are vital components of the two aforementioned birthing sequences. The first case in point is the environment in which Riley remembers her birth as well as the precise circumstances of her being born. The second example is Angelica's very first impression of the cluster of the eight sensates she gives birth to. In Riley's case, it is noteworthy that her birth happens while her father's live piano play is instantly broadcast via a landline telephone. A lingering close-up of the phone draws particular attention to this device, which entire purpose generally is the transmission and reproduction of voices for the purpose of communication across vast distances.[27] Gunnar's live recital is thus simultaneously a technologized, reproduced performance. In addition, Riley's birth amidst her father's piano playing is itself a reproduced event: after all, she, like all of the other sensates, remembers this specific occasion. While the fact that the montage of births are memories adds an extra layer to these diverse reproductive creations, another form of reproduction takes place in the show's current moment. When Gunnar, with all eight sensates in attendance, performs Beethoven at Harpa, he also addresses the audience of *Sense8*.[28] Hence, this performance as well as the rotation of the eight sensates sitting at the concert highlights cinema's own powers of (re)creation. By interweaving cultural forms of reproduction with biological creation, the montage of births emphasizes the power of art, media, and technology to transmit and communicate emotion and empathy but the birth scene, more importantly, demonstrates how these entities are intrinsic parts of the human experience and, hence, existence.

In addition, Angelica's—and, hence, viewers'—first glimpse of the August 8 cluster indicates a similar connection between biological and cultural reproduction. The instant Angelica

exclaims that she sees the newly born eight sensates the image of Lito's hand drawing a gun appears, which notably is also a dramatic scene from the film project which the Mexican actor is in the process of shooting at exactly this particular moment. The fact that Lito is making a film in the instant he is reborn as a sensate points to the significance of art—especially of art that is reproducible—as a vital component of present-day human life. While the complete montage of births—as well as the series in its entirety—stands out for its skillful blend of naturalness and artificiality, this applies especially to the portrayal of Lito. In fact, Lito emerges in the show as the personification of technologically reproduced art, an incarnation that constitutes itself in the moment of his birth. When the Mexican actor is born, his family is not simply shown watching television enthusiastically but the act of watching is (shown as) an artistic engagement. The entire setup of Lito's birth—the television in one corner of the room, opposite his mother lying down, surrounded by family members, has caught the attention of everyone in the room with the exception of one lone woman who is sitting on the floor, holding a baby, and gazing back at the spectacle of the family being engrossed in the action on screen—is carefully configurated in a way that resembles a staged performance or perhaps even a painting. This carefully designed—still yet, often overdramatically, animated—quality moreover describes Lito's entire representation on the show. His life is presented as a visual, cinematic, and artistic event. As a movie star, Lito is constantly in the public's eye, on screen, film posters, and selfies taken with fans. He finds confidence in rehearsing by looking at himself in the mirror[29] as well as at photographs of him in the role of one of his characters. In front of a Diego Rivera study at Mexico City's Anahuacalli Museum, Lito has an emotionally and sexually charged encounter with his boyfriend Hernando, an art teacher. An impressive collection of paintings, sculptures, as well as posters and photographs of the actor decorate their apartment, and the couple is repeatedly shown discussing art and its implication. In Lito and Hernando's relationship, art turns into a bond that, like the sensate connection, facilitates sensations, emotions, and empathy. When their mutual friend moves in and begins recording their personal life, their relationship and existence is further visualized and picturized.[30] This fetishized and aestheticized taping of their romance, especially both of them having sex, reaches another level of reproduction and distribution when those images and clips are released to the public in an act of revenge. In view of these private, sensual, and visual moments appearing on a screen in a classroom, Hernando, pushing back against his students' vitriolic mockery of same-sex relationships, interprets these images not as a pornographic spectacle but as an artistic composition, lecturing that "[a]rt is love made public."[31] As love made public, as well as an emotive, sensuous bond, art emerges here in lieu of the mental and emotional connection Homo sensorium share.

In this lecture to students, Hernando moreover comments on the important relationship between art, the act of beholding, and also being perceived. "It [art] is the language of seeing, and being seen," he explains to his students. Hernando's comment about the relationship between art, perception, and recognition is tied to the process of Angelica birthing the eight sensates at the beginning of the series. "I see them," she utters, before Lito appears acting in a movie. In other words, the creation of Homo sensorium is essentially the act of technologically reproducing humans via the camera and film. Processes of technological reproduction and the (re)creation of human beings on screen thus generate humanness and humanity.

The show makes this case especially via its engagement and investment in diversity, which is situated in the context of universality and deeply interwoven with universal themes. "'Sense8'," writes one reviewer, echoing others, "sets a new standard for diversity on TV" (Kyle).[32] To tell a story on a "planetary scale"—in J. Michael Straczynski's words, an international cast was hired

(Fienberg).[33] The actors' diverse cultural and ethnic backgrounds add authenticity to their characters and facilitate the portrayal of difference in appearance, self-expression, as well as language and accents. By shooting on location all over the world, the show particularly attempts to capture a balance between cultural specificity and universal commonalities. *Sense8*, indeed, received particular praise–including the Location Managers Guild Award for Outstanding Locations in a Contemporary Television Series—for actually filming in the protagonists' respective hometowns, in Chicago, Mumbai, Mexico City, Nairobi, Seoul, San Francisco, London, Reykjavík, and Berlin.[34]

The representation of Germany's capital perfectly exemplifies the showrunners' efforts to capture a location- and cultural-specific atmosphere, and to spotlight, at the same time, universal aspects of the human experience. The show thus represents Berlin as a city that is deeply shaped by history and the (physical) memory of its, often violent, past. As a result of Tom Tykwer's noticeable familiarity with the city and, likely, the show's global distribution, scenes of Berlin evoke Germany's National Socialist past and the country's division into the German Federal Republic (FDR) and the German Democratic Republic (GDR).[35] Throughout the show, images of the Schiller-Monument, the Jacob-und-Wilhelm-Grimm Zentrum,[36] the Jewish Museum's Garden of Exile, the Bode Museum on the Museumsinsel,[37] the Brandenburg Gate, pieces of the Wall, and the Stadtbad Neukölln[38] are featured alongside scenes from the Osthafen, the fashion center "Labels Berlin 2," the Fernsehwerft,[39] the Treptowers, and, notably, the Molecule Man. This latter work of art, located where three Berlin districts, Alt-Treptow, Kreuzberg, and Friedrichshein, converge, bears a similar significance as the key message of the Netflix series, as American artist Jonathan Borofsky, who created the 30m tall aluminum sculpture, explains:

> For me, this hundred-foot tall aluminum sculpture composed of three figures meeting in the center, not only refers to the lightness inside our own solid bodies, but also the figures joining in the center, refer to the molecules of all human beings coming together to create our existence. This symbolism is especially poignant for this 100-foot Molecule Man on the Spree River in Berlin since the river marked the division between East and West Berlin.

Borofsky's Molecule Man, thus, turns into a symbol for the sensate experience that is a biological part of being Homo sensorium as well as an essential aspect of engaging with art. In the portrayal of Berlin's historical, architectural landmarks art converges with memory, and vice versa.

The circumstance that Berlin becomes a symbol of cultural memory is moreover reflected in the portrayal of Wolfgang. Wolfgang's storyline essentially boils down to a coming to terms with his abusive, violent past. While the tenth episode "What is Human?" ends with all of the eight sensates being at the concert at the Harpa at exactly the same time while remembering collectively their respective births, the episode notably begins with Wolfgang pondering the consequences of past decisions in the Garden of Exile in Berlin's Jewish Museum.[40] This location, which features the haunting inscription "Ist der Holocaust ein Irrweg oder eine Spiegelung unseres Selbst?,"[41] represents the first location that all of the sensates visit one after another. As Wolfgang wanders on uneven ground through the 49 concrete steles, he gradually encounters each of the seven other members of his cluster. Daniel Libeskind's memorial, a symbol of home and foreignness, flight and escape, peace and hope, end and beginning, becomes a place of decision-making about the past, present, and future. Wolfgang's contemplation of the reflecting inscription is interrupted by the arrival of Will, who brings along the sound of laughing children playing with water, celebrating

Independence Day in the US. At the end of this sequence, Berlin's violent past and contemporary memory culture converges with American ideals of liberty and freedom.

To conclude, *Sense8* imagines biological and cultural processes of reproduction as intrinsically intertwined. Via the reproduction of the Homo sensorium, the show envisions human existence in biological terms. Yet, the meaning of humanness emerges specifically in the biological interaction with cultural reproductions. The latter complete being human because artistic reproductive technologies such as cinematic images provide a catalyst for emotions and empathy. Art is here always universal, yet distinctly individual: it shapes and transmits human universality, which is equally imagined as human diversity. Art, which is the reproduction of the human experience, as much as the perception of the universality and diversity of this existence, is thus also a means to store and transmit cultural memory. In *Sense8*, artistic reproduction and their interplay with humans therefore mirror the psycelium.

## The Reproduction of the Homo Sensorium

By outlining the biological and cultural changes resulting from the rise of cinematic technology—embodied by the figure of the Homo cinematicus, writers of the early twentieth century attempted to not only explain those transformations but by ascribing meaning to those changes they also made them reality. Viewed as an *artificial alien*, the Homo cinematicus poses the question of what follows in its footsteps. *Sense8*, I argue, envisions the Homo sensorium and, in fact, creates it via Netflix's streaming platform. The circumstance that *Sense8* is a Netflix original series is key to the way the show has been conceptualized, produced, distributed, and watched. Netflix's particular approach to producing and distributing its series and films plays a vital role in bringing to life the Homo sensorium.

First, diversity and inclusion are moreover practiced via Netflix's particular way of distributing its content. The American entertainment company was founded in 1997. Its original purpose was to offer Americans the ability to rent DVDs via the postal service. The company ultimately changed the way people watch films and television nowadays when, in 2007 and in 2014 in Germany, offering its library online as streaming on demand. As a global streaming platform, which is currently available in over 190 countries, used by over 100 million users worldwide,[42] and supports 20 languages, Netflix's original series, which the company began producing in 2013, are released in their entirety at once to a global audience at the same point in time. The fact that the show makes its own shows as well as the vast majority of third-party content available at once has transformed the way people watch television. The instant availability of entire seasons has enabled viewers to watch these Netflix shows immediately in their entirety. Viewers have mostly embraced the instant availability and have responded by watching entire series in one sitting. This act of intense viewing—binge-watching—has arguably ramifications on viewers' perception. It is also noteworthy that Netflix—since it releases its own shows generally at the same time—allows for a collective viewing experience across large distances.

Thus, streaming technology, I argue, allows *Sense8* to re-enact the psycelium. The best case in point for such a re-enacting of the sensates' special connection is the show's "What's Up" sequence. Here, Riley, sitting on top of Primrose Hill, locked in deep thought with a vaporizer in her hand while looking out over London's skyline, picks out 4 Non Blonde's 1992 song "What's Up" from her Ipod's screen; the Netflix audience sees the title of the song before the first sounds

are heard. The camera cuts next to Wolfgang, who performs "What's Up" in a Karaoke bar in Berlin, the song's lyrics on display behind him. Lito, lying in bed, taps his foot along to the music. Ultimately, all of the sensates join Riley and Wolfgang by singing, humming, and clapping along; Kala and Wolfgang end up visiting each other, singing together in Berlin and on a rooftop in Mumbai, respectively. The sequence ends with Kala waking up in her bed, remembering the events as a happy, joyful dream. "That the world was made up of this brotherhood of man / For whatever that means"—those lyrics not only refer to the cluster of eight singing sensates but the entire music montage is an explicit invitation to Netflix's global, simultaneously binge-watching audience to dance along, to also chant "What's going on?," and to emotionally connect to the joyfulness performed on screen. "I have conversed with the spiritual sun," reads the William Blake inscription on the York stone edging on Primrose Hill, and on which Riley is sitting. So have we all, *Sense8* implies. The fact that the episode was celebrated by reviewers, and viewers alike—a YouTube video of the montage has almost 2 Million views—suggests that *Sense8* successfully facilitated the building of a sensory and emotional, yet diverse and international network imitative of the sensates' psycelium via a musical, cinematic performance. The birth montage was thus always also an invitation to participate in this celebration of universal and diverse experience by connecting collectively via the emotional response the sequence demanded. It is a celebration of the reproductive image of the Homo sensorium that is dispersed and also consumed across the world by fellow sensates binge-watching at home.

## The Homo Sensorium vs Images of (In)Humanness

On January 8, 2016, the cover of the *Focus* magazine tackled the sexual assaults on women in Cologne by groups of men, predominantly from North African and other Arab countries, on New Year's Eve.[43] It features a naked white woman, who satisfies stereotypical Western beauty ideals. Skinny with blond, half-cut length hair, her torso with her face cut off just above the tip of her nose is depicted in front of a grey background. Her mouth is slightly open, her left arm is folded across her breasts, while her right hand protects her pubic area. Her naked body is covered with large black handprints. The red cover headline "Women bringing charges forward. After the sexual attacks by migrants: Are we still tolerant or already blind?" superimposes the photo.[44] The *Süddeutsche Zeitung* responded to the events at the Cologne train station and in other German cities by printing a black and white image, featuring white legs and a black hand grabbing in the implied woman's crotch. On February 27, 2016, Erika Steinbach, former president of the Bund der Vertriebenen from 1998 until 2014 and the CDU/CSU spokeswoman for human rights, tweeted the photo of a white toddler with blond, curly hair who is surrounded by a group of laughing, intrigued looking Indian children. The photo features the heading: "Germany 2030? Where are you from?"[45] On September 2, 2015—three days before Angela Merkel opened Germany's borders for hundred thousand refugees, the death of Alan Kurdi, a three-year old Syrian boy of Kurdish descent who drowned in the Mediterranean Sea, moved the world; or rather, the image of Alan's washed up body on the beach near Bodrum, Turkey, did. The picture of crying, desperate Laith al-Amiri carrying his daughter Noor coming off a flimsy boat in Greece, and another Syrian father holding up his infant daughter who is grabbing onto barbwire at the Syrian-Turkish border also went viral, as did the footage of an Hungarian camera woman tripping a father and his child.

While all of these images respond to the "refugee crisis" that has dominated much of the public debates in Germany and Europe in the past and present year, they were produced and

published for different and conflicting reasons. Nonetheless, all of these visual responses to the millions of refugees arriving in Germany pose similar questions, and attempt to connect to viewers in similar ways. All of them depict, or imply human suffering, and, thus, try to evoke an empathic reaction. The term "empathy" has various meanings, depending on the context and scholarly theory, as well as emotion described. This discussion relies on the following psychological definition of empathy, namely "the understanding and sharing of another's emotional state" (Gal Raz et al. 30). This definition implies the ability to take someone else's position, to feel and understand someone else's viewpoint, and to face them with sympathy. The experience of empathy does not prevent the simultaneous advent of negative or exclusionary feelings. It is also worthwhile to remember that the term "empathy" made its way into the English language as a translation of "Einfühlung," a concept from philosophical aesthetics, and that recent neurological research has focused on brain architecture to explain empathetic emotions. As Steven Pinker has outlined in his work, interest in empathy has been steadily on the rise. The growing attention to empathy, as well as the images' appeal for an empathetic response point to a fundamental question that is becoming more relevant in times of globalization, lived multiculturalism, and migrant mobility: How do we relate to other people, in particular if they appear foreign and even alien? Indeed, the German public response to the recent "refugee crisis," captured in the aforementioned images, demonstrates that this issue is ultimately connected to a more fundamental question: The question of what it means to be a German, a foreigner, an alien, a migrant, a refugee ultimately asks what it means to be human.

Germany's Nazi past has been constantly evoked in debates and reactions to the ongoing "refugee crisis," either as an imperative to help, or as recurrence of past ideas suddenly gaining currency again; the previously discussed images are a stark reminder of this. At first glance, a science-fiction series such as Netflix's *Sense8* seems to have little to say about the flight of millions to Europe. And vice versa, *Sense8* certainly plays no role whatsoever in German discussions about refugees. Yet, both of these current events, I argue, are invested in similar questions, namely what it means to be human at this particular point in time, and, perhaps more importantly, what existing together should look like in the future. In their evocation of the Holocaust and its memory, both glance back at history in hope of shaping the present. They also point to the role that visual media plays in this endeavour. Placed in constellation, *Sense8* and responses to the "refugee crisis" remind us that defining what it means to be human is an ongoing, never-ending process, which is largely defined by visual media that creates reality on and off the screen, and that this project—at a time when poisoned skittles appear to be an appropriate synonym for refugees, and the idea that a Senegalese also becomes German cannot even be entertained—is reaching another crucial turning point.

## Notes

1 Cf. Jean-Jacques Hublin et al.
2 Benjamin's observation evokes the definition of reproduction provided in the first chapter of this dissertation, which stated that the term first referred to the copy of a work of art in 1839.
3 It is noteworthy that, as Benjamin states, the aura of certain works of art originated in their simple existence, irrespective of ever having been represented.
4 Stapel believed that seeing movies had similar detrimental effects as drinking alcohol.
5 Cf. Richard Guttmann's "Cinematic Mankind: Attempt at a Principal Analysis" (qtd. in Kaes et al. 238-240). Cf. also Andreas Killen 1-22 for an intriguing discussion and use of Stapel's "homo cinematicus."

6 Cf. Killen who adopts Stapel's phrase for his examination of the relationship between cinema and the human sciences in Weimar Germany (20).
7 Nomi Marks is portrayed by American transgender actress Jamie Clayton; Spanish actor Miguel Ángel Silvestre plays Lito Rodriguez; Will Gorski is depicted by Brian J. Smith from Dallas, Texas; English actress Tuppence Middleton represents Riley Blue; Capheus "Van Damn" Onyango was portrayed by British actor Aml Ameen during and by American actor Toby Onwumere after the first season; South Korean actress Doona Bae personifies Sun Bak; and Kala Dandekar is played by Indian actress Tina Desai. Riemelt is known for movies such as *Napola* (2003/2004), *Die Welle* (2007/2008), and *Freier Fall* (2013/2014).
8 The show introduced the scientific term for "sensate," "Homo sensorium," only after its first season (cf. @straczynski).
9 Also spelled "psycellium."
10 Netflix released the special on December 23, 2016. The second season, consisting of another ten episodes, continued on May 5, 2017. While the series was originally cancelled shortly after the release of the second season—as it did not generate enough profit for the amount it cost to make, Netflix officials ultimately reversed their decision and announced a two-hour finale to be released in 2018. The following analysis will primarily focus on two episodes from the first season, namely episode four, "'What's Going On?'", and episode ten, "What is Human?". Mr. Whispers is played by Terrence Mann.
11 "*Run Lola Run*." Instead of directing an entire episode, directors for the show directed based on locations. In the second season, Tykwer only directed the Nairobi scenes, since he was otherwise occupied with the production of his new television show *Babylon Berlin* (2017-). Tywker and his fellow composer Johnny Klimek were nominated for the Emmy award for the category of "Outstanding Original Main Title Theme Music."
12 Portrayed by Naveen Andrews.
13 Played by Daryl Hannah.
14 These particular images, along with her name, evoke religious imagery of Christian angels and the Virgin Mary. Angelica's white dress and its associations thus stand in stark contrast to her run-down, drugged appearance and a heartfelt confession that she hopes no one else were to die because of her actions. It should also be noted here that Jonas is only with Angelica via their sensate connection, a process that is further explained below.
15 This is also the moment when the sensates' and the "*Sense 8* Title Theme", composed by Tom Tykwer and Johnny Klimek, begins to play for the very first time.
16 Noteworthy she is not shown, only wolfgang's reaction and also no surprise he would notice first as a criminal
17 Misra links precisely this experience of a "we" to multiple personality disorders. The obvious difference is, of course, that the sensate experience includes eight individual bodies, while the disorder manifests itself only in one person.
18 Cf. the Wachowskis' interview with Meredith Woerner.
19 Played by Kristján Kristjánsson.
20 Portrayed by Freema Agyeman.
21 Portrayed by Alfonso Herrera.
22 The Harpa Reykjavík Concert Hall, created by the Icelandic-Danish artist Olafur Eliasson, is the home of the Iceland Symphony Orchestra, which performed the Beethoven piece for *Sense8* (@IcelandSymphony). Actor Kristján Kristjánsson (Gunnar) uses Þorsteinn Gauti Sigurðsson as a hand double.
23 The births are shown in the same order as the precedent scene showing the arrival of all eight sensates, with the exception of Lito and Sun whose order was switched.
24 This particular emphasis on the role of women and female bodies in processes of natural reproduction—both in the role of parturients as well as a support network (midwifes, relatives)—stands in stark contrast to the involvement of the male creators discussed in the chapter on German silent films. Angelica's portrayal, however, evokes the portrayal and purpose of the yrr queen in *Der Schwarm*.
25 Although Riley gave birth to her daughter, the infant did not survive the ordeal.
26 Cf. Rowan Kaiser on the artifice of the birth montage.
27 In another scene, the telephone also emerges as an important technological device that enables communication and, most importantly, creates reality: in an attempt to rule out that both of them simply hallucinate, Riley and Will call each other. Their cell phones, especially when they hear the audible feedback of each other's voices, confirm their existence, respectively.
28 This kind of drawing the audience into the show is best demonstrated in the series's "What's-Up" sequence, discussed below.

29 Mirrors play a vital role in the series. It is thus no coincidence that Angelica appears to Nomi as a reflection first. The use of mirrors and mirror images reflects on and highlights the necessity to be seen.
30 Daniela Velazquez Played by Eréndira Ibarra, serves Lito as a beard.
31 During a previous episode, Hernando explains to Lito in front of the painting by Diego Rivera: "Love is just like art. Look, love is not something we wind up, something we set or control. Love is just like art: a force that comes into our lives without any rules, expectations or limitations. Love like art, must always be free."
32 Cf. also "Is *Sense8* Too Radical for Critics?," which raises the issue if the diversity of the show turns away critics and viewers, and Carimah Townes.
33 cf. footnote above for a detailed overview of the actors' backgrounds.
34 The second season was also filmed in cities such as Amsterdam and São Paulo. *Sense8*'s opening credits, an almost two-minute long sequence, feature hundreds of different impressions from these places from across the world. Cf. Lori Rackl's in-depth breakdown of the show's title sequence. "'My directive from Lana,'" Karin Winslow, who took these images, explains in an interview with Rackl, "'was to go out and describe each country by what you see; find the nuances, find the food, find what people are doing, get a feel for the place.'"
35 In terms of the show's commitment to challenge common depictions on television, and provide a more diverse cast of protagonists, it is noteworthy that Wolfgang, like Max Riemelt, grew up in East Germany. The show even features a short scene in which Wolfgang is bullied by classmates for his upbringing in the communist part of the country.
36 Via its name, the library, which is part of Berlin's Humboldt University and houses the largest open shelving book collection in German-speaking countries, points to the country's rich literary history.
37 "Museum Island."
38 Historical public pool in Neukölln.
39 "TV-Wharf." This area is home to a variety of media companies (*MTV*, *VIVA*) and its vacant, undeveloped land is used for filming films and television shows (*ZDF*, *RTL 2*).
40 Commentators online often mistake this location for the Memorial to the Murdered Jews of Europe.
41 "Is the Holocaust an aberration, or a reflection of ourselves?"
42 Netflix is not yet available in China.
43 Cf. Álvarez for summary of these images.
44 "Frauen klagen an. Nach den Sex-Attacken von Migranten: Sind wir noch tolerant oder schon blind?"
45 "Deutschland 2030? Woher kommst du denn?" Cf. "Geschmackloser geht's nicht."

## Concluding Remarks

At the 2016 Annual Conference of the German Studies Association, the Visual Culture Network organized several panels connected by the guiding question of the role of the human in German visual culture. Organizers initially asked panelists if "figurations of the human" were "all too human" "in an ostensibly posthuman age" (Mathews and Moltke). The circumstance that coordinators of the network as well as organizers of the conference raised this issue suggests, on the one hand, a current need to consider this question. By doing so, this event, on the other hand, exemplifies how this subject matter is in itself a topic that displays a recurring exigency.

This enduring desire to revisit the question of what it means to be human, especially by imagining it, is also one of the ways the previous case studies are connected. These case studies imagine *artificial aliens* to explore diverse aspects of the human experience. By doing so, they actively participate in *Menschenbildung*. In their engagement with *Menschenbildung*, they demonstrate that their *Gedankenexperimente* are ultimately driven by reproductive imaginations. Reproductive imaginations, in summary, are fuelled by a complex interplay between biological and cultural processes of reproduction, which are intrinsically tied to questions of the nature of media, identity, and memory. Hence, reproductive imaginations play a crucial role in self-conceptions of the human species, especially because of the (im)materiality of the cinematic image. Reproductive imaginations are, in other words, at the core of what it means to be human, what specific factors constitute humanness, and how being human is perpetuated. Reproductive imaginations are thus always itself of a reproductive nature.

One of the ways in which reproductive imaginations are reproductive is by posing questions of "where are we to find ourselves?", who we are, and how we connect over and over again. This query is, in fact, at the bottom of the previously discussed case studies as *Gedankenexperimente* but moreover the driving force behind reproductive imaginations themselves. Although the previously discussed case studies, their *artificial aliens*, and those *aliens*' cultural significance differ, all of these aspects are connected by this particular question, which ultimately asks how human life is constituted, how this life regulates relationships with other humans, on an individual but also collective level, and how this individual and collective existence is shaped but also reproduced via technological and artistic means.

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