

# Chapter 1

## Introduction: An Oblique Perspective on Research Misconduct

### 1.1 Research Misconduct Novels and Integrity Challenges in Science

Research misconduct (*fabricating, falsifying or plagiarising* research, also known as FFP),<sup>1</sup> has become an object of concern, not only for scientists and scholars, but also for managers, funders and publishers of research (Fanelli 2009; European Science Foundation 2010; Drenth 2010; Horbach and Halfman 2016). FFP and other “questionable research practices” (QRP) are discussed in various types of discourse, such as reports, guidelines and codes of conduct, but also in a plethora of scholarly publications, ranging from empirical studies (often from a sociology of science or scientometrics perspective) via normative and/or conceptual analyses (often from a science ethics or philosophy of science perspective) up to editorials. This monograph proposes to study research misconduct from a somewhat different, *oblique* perspective, namely by analysing *research misconduct novels*, i.e. novels about contemporary research practices, focussing on FFP, but against the backdrop of a more extended research integrity landscape. Such novels, I will argue, help us to understand, but also to open-up and broaden the issues involved. They often entail a multidimensional approach, focussing on individual experiences, but sensitive to the wider systemic context, allowing us to study research misconduct from multiple viewpoints and to see the current wave of scientific misconduct deliberations as symptomatic for fundamental transformations in the ways in which knowledge is currently produced and valued. As Lex Bouter (former Rector and now professor of methodology and integrity at the *Free University of Amsterdam*) phrases it, “Scientists are exposed to temptations and ... it would make a wonderful theme for an exciting movie or a compelling book. The novel is perhaps the best form for investigating the essence of what scientists do, and why they do it” (Bouter 2015, p. 148).

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<sup>1</sup><https://ori.hhs.gov/definition-misconduct>

In my experience, a significant part of standard “misconduct discourse” tends to be fairly repetitive and predictable, notably because researchers and their work “are usually treated very much as an abstraction, removed from the time and place of the local laboratory situation and with strong emphasis on formal aspects” (Miedema 2012, p. 71). Many contributors therefore try to open up alternative, bottom-up perspectives. My approach to the integrity crisis analyses a series of literary case studies from a continental philosophical perspective, using Lacanian psychoanalysis as my frame of reference. Both dimensions (the literary case study as well as the continental psychoanalytical perspective) require some introduction.

First of all, to strengthen the quality and relevance of the discourse, it is important to combine proximity (i.e. input from actual research practices) with critical distance and reflection. For that reason, many contributors to the research misconduct debate opt for a case study approach, as exemplified for instance by David Goodstein’s *Cautionary tales from the front lines of science* (2010), written by a physics researcher who later became a research administrator at Caltech. His book focusses on a series of real life cases (“tales”) in which the author had been “personally involved during his career” (p. xi). Although likewise opting for a case studies approach, my case studies will be science novels, so that this monograph can be seen as part of the “literature and science movement” (Peterfreund 1990; Caudill 2011). But whereas many contributions to “science and literature studies” focus on popular *images* of scientists and science in the public realm, I rather use science novels as windows into actual research practices, as imaginative laboratories for probing the epistemological and ethical quandaries of technoscience. Science novels, also known as “lablit” (Rohn 2006; Rohn 2010) or “campus literature” (Miedema 2012, p. 74), purport to describe research dilemmas or questionable practices emerging in contemporary scientific settings in a convincing and realistic manner (Caudill 2011, p. 3; Zwart 2014a, p. 1). Moreover, I regard literary case studies as *case histories*, using a novel as a *Fallgeschichte* in the psychoanalytic sense of the term. Integrity issues emerging in science novels will be addressed from a “European” (Huxtable and ter Meulen 2015) or “continental” perspective. Continental philosophy (dialectics, phenomenology, psychoanalysis, etc.) of science may contribute to a critical diagnostics of the techno-scientific present (Zwart et al. 2016), a conviction which is also endorsed by the *Library of Ethics and Applied Philosophy* in which this volume is published.<sup>2</sup>

Seven FFP novels have been selected for this purpose,<sup>3</sup> namely: *Arrowsmith* by Sinclair Lewis (1925), *The affair* by C.P. Snow (1960), *Cantor’s dilemma* by Carl Djerassi (1989), *Perlmann’s Silence* by Pascal Mercier (1995), *Intuition* by Allegra Goodman (2006), *Solar* by Ian McEwan (2010) and *Derailment* by Diederik Stapel (2012). Although *Derailment* is actually an autobiographical case study (which “reads like a novel”), my reasons for including this ego-document will be explained

<sup>2</sup> <http://www.springer.com/series/6230>

<sup>3</sup> My analyses of *Arrowsmith*, *Perlmann’s Silence* and *Solar* are revised versions of previous publications (Zwart 2015b, 2016c). A list of scientific misconduct novels can be found at the website of the *Netherlands Research Integrity Network* (<https://www.nrin.nl/library/books/fiction>).

in more detail in Chap. 11. These novels offer intriguing windows into contemporary research practices and may be regarded as imaginative laboratories for exploring the various ethical, philosophical and psychological dimensions involved. They allow us to develop a more comprehensive view of integrity challenges emerging in the contemporary academic research landscape.

To each of these case studies a separate chapter has been devoted. In addition, some other examples of literary documents concerning research integrity and misconduct will be discussed in the introductory chapters of this monograph. These introductory analyses will allow me to develop my methodology and explore the terrain. They include some fairly recent novels, such as *Limitless* (2001/2011) by Allan Glynn (discussed below), but also historical examples discussed in Chaps. 3 and 4, namely *Hamlet* by Shakespeare (1600), *Carmen* by Prosper Mérimée (1845/1965), *An Enemy of the People* by Henrik Ibsen (1882/1978), *Dr. Ox's Experiment* by Jules Verne (1872/1875) and *The Man who would be God* by Haakon Chevalier (1959).

In terms of conceptual framework, these literary documents (the seven literary FFP case studies in combination with the five introductory readings) will be analysed and assessed from a Lacanian perspective. Whereas mainstream ethical discussions tend to focus either on FFP infractions by individual researchers or on solutions (optimal or more acceptable scenarios for addressing the integrity challenges at hand), a Lacanian reading emphasises that the individuals involved often face more fundamental and devastating forms of crisis, which available codes and guidelines fail to address and for which available norms and concepts fail to provide credible or workable solutions.

Lacan grafted his theories on multiple precursors (standing on the shoulders of multiple others), but Hegelian dialectics and Freudian psychoanalysis stand out as his most decisive sources of inspiration. From a Hegelian perspective, integrity dilemmas challenge our basic normative and epistemological convictions in a very fundamental way, often revealing the one-sidedness and naivety of the very principles from which we started. From a Freudian-psychoanalytical perspective, moreover, scientific research emerges as an “impossible profession” (Freud 1925/1948; Freud 1937/1950). Researchers are spurred on by demanding but often conflicting imperatives and may easily become tormented subjects, driven by a pervasive desire to know, but challenged and frustrated by intractable, disconcerting or even toxic objects, as well as by the increasingly compelling expectations of the knowledge production system (the scientific super-ego). Special attention will be given to the paradoxes and tensions of what Lacan refers to as “university discourse”. Thus, the basic objective of this monograph is to explain how a close reading of research misconduct novels (as a “genre of the imagination”) may add depth, detail and even realism to the current conceptual and normative quandaries of integrity discourse.

## 1.2 Between Two Worlds: From Plato’s Cave to Emile Zola’s Experimental Novel

This effort to initiate a dialogue between scientific research practices on the one hand and science novels on the other positions itself against the backdrop of a long history of reflection on the relationship between rationality and imagination. The cradle of this debate is Plato’s famous simile of the cave: a paradoxical story (or imaginative experiment) intended to demonstrate that an insurmountable epistemological rupture separates story-telling from rational inquiry. The simile (incorporated in Plato’s magnum opus: *Republic*, Book VII) involves a group of humans, dwelling in a subterranean cavern, whose legs and necks are fettered from childhood, so that they can only stare at the wall in front of them (Plato 1935/2000, 514–518). A fire is burning higher up, at a distance behind them, and between the fire and the prisoners a low wall has been built, and behind that wall human images and shapes of humans and animals are carried about, as in puppet-shows, whose shadows are cast onto the wall. Moreover, Plato also mentions revolving triangular wooden devices (περίακτοι), used in ancient Greek drama for displaying (and rapidly changing) theatre scenes (518C).



At a certain point, one of the prisoners is freed from his chains and dragged away towards the light. He is literally “educated” (from *educere*: to lead out) and “converted” away from the world of stories, images and opinions (δόξα) up to the world

of true knowledge (ἐπιστήμη). The ambiance suddenly changes and the scene-shifting device (περίακτος) is turned towards the light. Notably, the former prisoner is initiated into astronomy and cosmology. He begins his academic career by gazing at the stars and the moon at night, not yet sufficiently habituated to withstand the painful, glittering light of the sun itself. Emancipation (enlightenment) is a traumatic experience, a birth trauma, an intellectual awakening.

In Plato's scene we may discern the contours of a Palaeolithic facility for keeping domesticated humans: a domesticated human "herd" as Plato phrases it in another dialogue (*Politikos*), hypnotized and entranced by the moving images projected on a screen: a Flintstone-like cinema based on pyro-technology (Zwart 2010). But perhaps we may also see it as an anticipatory vision of passengers on a transatlantic flight. The simile adheres to a three-step procedure in which three *moments* can be distinguished. Initially ( $M_1$ ), the cave-dwellers seem perfectly at home in their world of images and stories: their prehistoric, cinematic womb. The second moment ( $M_2$ ) is a situation of increased intensity and tension: the (involuntary) liberation from the cave, a *negation* (dialectically speaking) of the comfortable world of opinion (δόξα), an experience of struggle and emancipation. But it also introduces a basic contradiction or rupture into the lives of the individuals involved, as well as into human culture as such, namely between the rational and the narrative (or imaginative) realm.

This contradiction can only be overcome (*sublated*, dialectically speaking) by constructing a rational world-view ( $\rightarrow M_3$ ), allowing us to replace the traditional mythological cosmology of the initial cave scene by a more advanced and comprehensive view, in which the newly acquired research-based experiences are incorporated. This worldview builds on rational components, but complemented by (enlightened) imagination, so that the rational, but fragmentary knowledge components are coagulated into an encompassing vision. This third moment ( $M_3$ ) can be discerned in another tale by Plato, told towards the end of *Republic* (Book X, 614–621), about a soldier named Er who was slain in battle, a story that was later retold (in a slightly adapted version) by Cicero in his *Somnium Scipionis* ("Scipio's dream"), the final chapter of his treatise *De re publica* (Cicero 1928; Zwart 2012). Er's body is already deposited on a funeral pyre, ready to be burned, when he suddenly revives to tell the story of his journey through space which, besides an account of divine judgement and the rebirth of souls, contains a vision of the Platonic cosmos. His soul, unchained (released from earthly existence) enters and floats through heavenly regions, as a detached, disembodied astronomer as it were, discerning the supra-lunar cosmos, consisting (in Cicero's version) of nine spheres: the sphere of the supreme deity, of the stars, of Saturn, of Jupiter, Mars, the sun, Venus, Mercury and the moon. The sounds produced by the impetus and movement of the spheres (in Plato's version: by Sirens standing on the rims of the celestial circles, borne around in revolution, uttering one single note, 617B) is audible as a celestial symphony. The story not only conveys a model of the universe, but actually represents a dialectical synthesis of rational inquiry and (astronomically-informed) imagination ( $M_3$ ).

But this was written long ago and science has evolved into a modern, decidedly experimental and technology-driven phenomenon. The term scientist is of recent origin in fact, coined in the nineteenth century by Whewell (Ross 1962). How to envision the relationship between rationality and imagination under modern conditions? In his treatise *The Experimental Novel* (1880/1923), Emile Zola determines the relationship between experimental research and literary imagination in a different manner. Zola's ambition as a novelist was to move away from the romantic novel of the early nineteenth century and to produce a different genre: the *realistic*, *physiological*, or *naturalistic* novel: science-compatible as it were. *Le Ventre de Paris* [*The Fat and the Thin*] for instance is a novel which reflects the physiology of digestion. For Zola, a basic rupture between science and literary imagination (as suggested in Plato's simile) does not exist. After reading the influential textbook *Introduction to the Study of Experimental Medicine* by physiologist/vivisectionist Claude Bernard (1865/1966), Zola concludes that novels are basically laboratories and adhere to an experimental design. Protagonists are basically research subjects exposed to various challenges (i.e. experimental conditions) and the question is: how will they respond (given their background, temperament, psychic characteristics, physiology, etc.) to the stimuli, the environmental factors that are consciously manipulated by the experimental author? Indeed, even the literary characters themselves conduct experiments upon one another. According to Zola, such an approach will put the art and practice of novel-writing on a scientific footing. Rather than *describing* the world as it presents itself to us, experimental novelists actively *intervene*, in order to expose their characters to specific circumstances and events. The novel is a laboratory where social phenomena may be analysed accurately and systematically. Naturalistic novels must therefore display the same measure of detachment and precision as scientific research reports (Zwart 2008a, 2014a).

Again, a three-step (dialectical) dynamics can be discerned in Zola's argument. Initially, readers feel perfectly at home in romantic stories, which convey a romanticized (imaginary) view of the world ( $M_1$ ). Romantic novels are like Plato's puppet shows, projected onto the wall of the socio-cultural cave, hypnotising their audience. The intrusion of the scientific style of thinking allows us to escape from this "prison", so that a rupture is introduced between two worlds or cultural realms: the world of experimental research and the world of romantic fantasy and imagination ( $M_2$ ). This rupture can be overcome ("sublated"), however, in the form of the experimental novel, combining the experimental method of modern science with the powers of literary imagination ( $M_3$ ), adding realism and relevance to both and allowing us to address the complexities of human socio-cultural existence on a more advanced level of understanding. In short: novel-writing as the science of every-day societal existence. To reach this plateau, Zola argues, novelists must familiarise themselves with scientific research, by reading scientific textbooks and attending scientific lectures, so as to acquaint themselves with the logic of the experimental method.

The literary documents that will be analysed in this monograph all reflect the experimental design. In each case, the key protagonist (a scholar or scientist) is

exposed to unexpected challenges, to a novelty, a *novum* (a new discovery, enabled by certain technological innovations for instance), or to a frustrating epistemological obstacle. These novelties or obstacles function as literary *stimuli*, and the science novel basically describes and analyses the protagonist's responses. In fact, a science novel entails two types of experiments. In the first place, it describes scientific experiments as the core activity of laboratory life, conducted with the help of research equipment and focussed on viruses, microbes, model organisms, human research subjects, and so on. But the second experiment involves the researchers themselves, who now become research subjects as well, exposed to existential challenges and disruptive disturbances. In science novels, the experiment evolves into a case history, a *Fallgeschichte* in the psychoanalytical sense of the term, bridging the gap between experimental practice and narrative discourse (M<sub>3</sub>).

In terms of conceptual framework, the literary documents studied in this monograph (the seven FFP case histories plus the introductory readings concerning research integrity in a somewhat broader sense) will be analysed from a Lacanian perspective, building on Freudian psychoanalysis and Hegelian dialectics. Before introducing the basic Lacanian framework as such (in Chap. 2), I will therefore first outline Lacan's two major sources of intellectual inspiration, starting with Hegelian dialectics and subsequently proceeding to Freudian psychoanalysis.

### 1.3 Hegelian Dialectics and the Hwang Case

Dialectics refers to a ("continental") philosophical method which was developed by Georg Wilhelm Friedrich Hegel (1770–1831), but inspired by ancient (Socratic) and medieval (scholastic) traditions<sup>4</sup> and further developed by more recent authors (including Jacques Lacan, but also for instance Slavoj Žižek). Dialectics builds on the conviction that a dialectical logic (λόγος) can be discerned in the history of human thinking, which not only allows us to come to terms with and understand the present (against the backdrop of an extended historical past), but also to anticipate (and actively contribute to the unfolding of) the emerging future. In other words, dialectics combines intellectual with practical ambitions: it not only entails reflection and self-reflection, but also praxis and engagement (options for action).

The logic of dialectics builds on series of trichotomies: triadic patterns or sequences of *moments*, which will be referred to here as M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub>. Indeed, I already employed this dialectical pattern in my concise analyses of Plato's dialogue and Zola's essay above. A first example of a dialectical understanding of research misconduct may be the following. Initially, we seem to have a clear (albeit abstract)

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<sup>4</sup>The *Summa Theologica* by Thomas Aquinas may count as an exemplification of medieval dialectics. Each article starts with an initial conviction: *Videtur* (it seems to be the case that..., M<sub>1</sub>), which is subsequently challenged: *Sed contra est* (M<sub>2</sub>), so that a tension unfolds between contradictory positions, leading up to a more robust conclusion, on a higher level of comprehensiveness (M<sub>3</sub>).

understanding (*Begriff*) of what integrity *is* and how misconduct is to be avoided ( $M_1$ ). But as soon as researchers become actively involved in concrete research practices (as soon as they really become entangled in the vicissitudes of laboratory life), things may prove not as transparent and unequivocal as was initially expected. Contradictions and anomalies begin to emerge, involving tensions between codes of conduct and actual practices, between “backstage” and “frontstage”, between the “context of discovery” (the daily research activities in which researchers are actually involved) and the “context of justification” (a cleansed and standardised version of their methods and results, as reported in academic papers, suggesting a straightforward trajectory leading from question and hypothesis via experiment to conclusion). In their efforts to apply the formal procedures of the scientific method to concrete situations, researchers inevitably experience the recalcitrance and messiness of the complex realities they purport to study ( $M_2$ ). The empirical cycle, neatly described in methodological textbooks, begins to hamper and researchers may experience all kinds of compromising frustrations. Real research may seem chaotic and deficient in comparison with the normative methodological ideal. Theoretical expectations (hypotheses) are confronted with instances of “negation”, and it may prove impossible to replicate initial results. Even the conceptual framework or research methodology *as such* may become challenged.

Gradually, however, researchers will realise that this actually constitutes a crucial, inevitable and formative *experience*; that these frustrations and complications contribute to the *Bildung* process, the socialisation and edification of the scientists involved. In the long run, such problematic experiences may strengthen the robustness of their approach. The scientists’ “metal” is being tested, and these frustrations and disappointments are an inevitable part of being *in science*, basic predicaments of the scientific profession as such. Challenges may then be redefined as opportunities, allowing scientists to transform (“sublate”) their initial (abstract) conception of the scientific method into a genuine understanding of what research is about (reality-compatible as it were, and building on experience). Thus, they have reached a higher level of comprehension and performance (in dialectical terms: the “negation of the negation”), where abstract methodological standards evolve into robust research practices as part of a viable epistemological culture, or *Sittlichkeit* as Hegel phrases it, so that formal standards and actual practices (which at a certain point seemed to contradict one another) may become reconciled, in the context of best practices ( $M_2 \rightarrow M_3$ ). In order to reach this “third moment”, however, researchers have to expose themselves to and *work through* the painful experiences of the “second moment”, so that actual empirical research constitutes an important *experience* (food for reflection). But all this requires effort, labour and perseverance, and in real life, as obstacles and anomalies begin to accumulate, this “third” moment may prove horrendously difficult to attain ( $M_2 \rightarrow | M_3$ ).

Instead of facing these challenges, inevitably involved in real-life research practices, researchers (“subjects” of science) may become reluctant to expose themselves to the multiple tensions and frustrations emerging within the “context of discovery”. They may *deplore* the various problematic aspects of actual research practices to such an extent that they *abstain* from committing themselves to this



type of work, withdrawing into the safe haven of “clean” methodological convictions (keeping their hands and conscience clean), retreating into abstract, theoretical reflections about how the world *should* be, or sticking to the predictable, standardised and repetitive pathways of normal science. This is what Hegel refers to as the position of the beautiful soul (*schöne Seele*): the desire to avoid dirty hands at all costs, which Hegel considers a form of hypocrisy and deflection. In order for the scientific method to *realise* itself, the confrontation with concrete research practices (frustrating as this may be, even compromising at times) is unavoidable.

Another possibility, emerging in this force field of concrete research practices, is to opt for the short-cut, the aberration, in other words: misconduct as a desperate effort to release the tension between what the subjects involved actually manage to achieve and what is expected of them. From a dialectical perspective, all individual scientists, left to their own devices, are potential frauds. Every scientific individual feels haunted by the superego of science, by the harsh and apparently “impossible” expectations entailed in the scientific method: a position of tension and conflict which Hegel refers to as “morality” ( $M_2$ ). Yet, for Hegel, the only genuine solution is to move from this situation of chronic tension on the *individual level* (i.e. tension between the formal normative standards of proper conduct on the one hand and the practical problems and limited possibilities of concrete research projects on the other) towards the development of a *collective practice*, where this tension is sublated by *Bildung*, by developing practices of virtue, giving rise to a culture of self-reflection, where proper conduct is facilitated, encouraged and institutionalised, a situation which Hegel refers to as *Sittlichkeit* ( $M_3$ ).

Allow me to use a well-known example (a case history of research misconduct) to elucidate the dialectical approach. On 12 March 2004 the prominent South-Korean scientist Woo-Suk Hwang announced that he had succeeded in cloning human stem cells (Hwang et al. 2004). Western commentators regarded Hwang’s publication as evidence that South-Korea and other countries in the Far East (the “Wild” East) were quickly evolving into scientific “superpowers” (science tigers) notably because, compared to their Western competitors, they were much less hampered by ethics committees and ethical constraints (Zwart 2008b). To put it in literary terms: for Western researchers, Hwang acted as a *foil*, reflecting and highlighting the frustrations involved in the plethora of ethical regulations and constraints they were facing.

Soon, however, rumours began to emerge, notably concerning the claim that Hwang had recruited his female Ph.D. students to act as egg donors, a highly questionable research practice, raising serious concerns regarding health risks, gender issues, power relationships and the voluntary nature of the donation. In fact, a competition between two top journals evolved. Whereas Hwang and his team had published their paper in *Science*, many of the subsequent rumours and concerns were voiced in *Nature*. And things became even more dramatic when Hwang was forced to admit that his findings had been fabricated, so that his papers had to be retracted (Kennedy 2006; Gottweis and Triendl 2006). His name became associated, not with a major breakthrough, but with a highly visible case of fraud.

In this case study, the three dialectical moments are easily discernible. Initially, scientific ambitions and ethics requirements seem to go quite well together ( $M_1$ ), for in his *Science* paper, Hwang and his co-authors assure their readership of the ethical soundness of their research, stressing that it had been done in compliance with ethical rules and standards. Notably, they state that “before beginning any experiments we obtained approval for this study from the Institutional Review Board on Human Subjects Research” (Hwang et al. 2004, 1669). Wang also stressed that donors had donated oocytes and cumulus cells voluntarily, and that they had been “fully aware of the scope of our study and signed an informed consent form” (idem). Initially, this concordance of research and research ethics seemed something to be expected. Qualities such as veracity, reliability, conscientiousness, carefulness, responsibility, transparency, etc. are not only regarded as moral virtues, but also as important ingredients of proper scientific research, as crucial methodological skills. In other words, scientific research is initially presented as an inherently *moral* practice, conducted in a conscientious manner, and directed at addressing important societal concerns (the potential societal relevance of stem cell research, for instance in the context of transplantation medicine, where stem cells could be employed to replace faltering organs). Indeed, Hwang claimed that his breakthrough could have important clinical implications, that it was likely to have a major impact for the war against degenerative disorders such as diabetes and Parkinson’s disease (Hwang et al. 2004).

But as soon as critics and sceptics began to take a closer look at the way in which the research was actually conducted, in other words: at the backstage rather than the frontstage of the research, at the context of discovery rather than the context of justification, things proved to be much less smooth ( $M_2$ ). Remarkable tensions came into view between ethical requirements on the one hand and actual research practices on the other, for instance concerning the way in which the stem cells (oocytes) had been procured. The research proved to be decidedly unethical. It represented a *negation* or violation of ethical standards ( $M_2$ ). The actual experiments contradicted (Western?) requirements. Moreover, the Hwang case revealed that the global arena of stem cell research is actually a highly competitive landscape, involving fierce competition, between top journals for instance (*Nature* versus *Science*) but also between global regions (the *West* versus the *Far East*). Comments included the concern that in the West, scientific progress was delayed and frustrated by research ethics and distrust in science (technophobia), whereas in the East scientific progress was encouraged by a science-friendly climate and a supportive cultural environment, including well-funded laboratories and legislation that permitted cloning of human embryos for research. Again, Hwang acted as a foil for highlighting some of the challenges Western researchers were facing. In other words, the Hwang case not only reflected ethical issues, but also pointed to conflicts of power, between principal investigators (such as Hwang) and early stage researchers (his female Ph.D.’s), as well as between the scientific establishment (*Nature* as an elite scientific forum) and the newly emerging Asian scientific “tigers” (including South Korea).

Finally, however, Hwang’s exposure and downfall resulted in another remarkable dialectical turn ( $M_2 \rightarrow M_3$ ). Now it was argued that “Sound ethics and good research practice go hand in hand...”, that ethics is not a nuisance but an indispensable

infrastructure for quality management and science governance (cf. Zwart 2008b). Indeed, “good governance is crucial for research... Absence of regulation is not beneficial for research... Regulatory oversight adds another layer to the web of quality control in research” (Gottweis and Triendl 2006). In other words, in this third round of comments, the ethical infrastructure was suddenly regarded as an integral part of excellence in science: “Have your ethics in place!” In dialectical terms: on a more advanced level of comprehension, science and ethics became reconciled again. Both were acknowledged as complementary dimensions of good scientific practice (academic *Sittlichkeit*). Hwang still functioned as a foil, but now for highlighting the (self-perceived) ethical robustness of Western research practices.

From a macro-perspective, the Hwang case must be regarded as symptomatic for a broader, even global development. Frank Miedema (2012) professor of immunology and Dean of the Medical Faculty of Utrecht University, distinguishes three stages in the recent history of science. Science 1.0 ( $M_1$ , dialectically speaking) was a type of research that was autonomous and curiosity driven. Increasingly however, a different type of research seems called for (Science 2.0:  $M_2$ ), producing knowledge that is relevant for societal stakeholders and entailing economic value (Miedema 2012, p. 24). This implies new (post-classical) quality criteria, but also growing tensions and contradictions between the inherent dynamics of academic work and the societal and economic expectations involved. But eventually, according to the author, a situation of co-creation is evolving ( $\rightarrow M_3$ ), in which the questions and interests of science and society become more adequately aligned and knowledge production becomes coproduction: Science 3.0 ( $M_3$ ) (cf. Gibbons et al. 1994; Nowotny et al. 2001; Leydesdorff and Etzkowitz 2001).

## 1.4 A Second Dialectical Exercise: The *Limitless* Case

This same dialectical schema can be discerned in research misconduct novels. Science novels provide podiums where dramatic dialectical scenarios are enacted, albeit not always resulting in a “happy” end ( $M_3$ ). The dialectical trichotomy ( $M_1 \rightarrow M_2 \rightarrow M_3$ ) allows us to grasp the basic dramatic structure reflected in misconduct narratives. The first moment ( $M_1$ ) is comparable to what is often referred to as “exposition” (Freytag 1863). In the first chapters, we are introduced to the characters and their socio-cultural ambiance. During the second moment ( $M_2$ ), the (conflicting) demands and challenges become apparent, as key protagonist are exposed to novelties (new forms of knowledge or technicity, now types of laboratory equipment, new research targets, unexpected obstacles, etc.). The whole ambiance suddenly appears in a different light, as if the *περίακτοι* (the revolving triangular wooden devices of ancient Greek theatre) are turned around. Existing expectations and established behavioural repertoires prove insufficient, and this gives rise to tensions, conflicts and frustrations. In dialectical terms, the initial expectations are *negated* by the challenges and contradictions emerging in real research. The one-sidedness (or even naivety) of the initial principles and convictions is exposed. Key

protagonists must learn to come to terms with and domesticate the challenge, but this also involves a re-consideration of the basic principles themselves: a collective re-education. This is the third moment ( $M_3$ ) of reflection, catharsis or denouement (when the *περίοικοι* are turned again). This trichotomy of moments determines the basic logic of misconduct narratives.

Take for instance the novel *Limitless* (Glynn 2001/2011), discussed in more detail elsewhere (Zwart 2014a). The protagonist (Eddie Morra, a literary author living in Manhattan) has finally received his first book contract and seems about to realise his expectations and objectives ( $M_1$ ). Precisely at that moment, he faces a major challenge: a mid-life crisis, in the form of a paralysing writer's block. The usual behavioural options (withdrawal into his studio, staring at his computer screen for hours, smoking, alcohol consumption, etc.) fail to work ( $M_2$ ) and, in despair, he yearns for a way out to by-pass the hazardous route of *working through* the crisis. Coincidentally, he meets a former drug dealer, now working for a pharmaceutical company engaged in illegal experiments (in the wild), who offers him a "solution" in the form of a novelty: a nootropic drug named MDT-48. The dealer's job is to recruit early adopters (such as tormented authors) who are enrolled in unauthorised pre-clinical trials (so as to reduce the costs involved in developing marketable enhancement drugs). The protagonist takes the drug (reluctantly at first) and it works: he becomes a prolific author overnight. Apparently, the drug offers a shortcut, a panacea, so that he is suddenly able to overcome the paralysing tension between expectations and achievements.

The problem situation is not really sublated (*aufgehoben*) in the dialectical sense of the term, however, and the third moment is not really reached ( $M_2 \rightarrow | M_3$ ). Before long, side-effects begin to accumulate, symptomatic of the deficiency of the solution (brain doping). Besides suffering from memory loss and nausea, the protagonist becomes addicted to the drug, and MDT increasingly takes over his life. In accordance with the dual meaning of the Greek term for pharmaceuticals (*φάρμακον*), the drug (a bio-active, toxic, nootropic substance) is both a medicine and a poison. The tension between expectations and performance ( $M_2$ ) resurges, but now on a higher level of intensity. In the novel version, the protagonist dramatically fails to adequately address the challenge and in the end he proves utterly unable to "sublate" his problem ( $M_2 \rightarrow | M_3$ ). In the movie version, however, he apparently manages to domesticate the drug and to re-educate himself, in such a way that he is able to live on an optimal dose (increasing performance benefits while avoiding addiction and other drawbacks).

From a dialectical perspective, however, the movie outcome must still be regarded as suboptimal. The reconciliation between expectations and performance is not really achieved and the contraction is not really sublated (the *negativity* of the situation is not really *negated*). For although the individual apparently manages to survive (temporarily at least), his experiences are not really used to bring about a conversion, a metanoia, a systemic change, neither individually nor collectively. Notably, the misconduct committed by pharmaceutical companies and other mega-actors is neither exposed nor addressed, so that the problem continues, and new victims are likely to become trapped in similar scenarios.

We may look at the novel from various perspectives, first of all from the perspective of *knowledge*. The designer drug reflects a neuro-centric view, both on human existence in general and on individual achievement in particular ( $M_1$ ), reducing the phenomena of artistic creativity to the flow of neurotransmitters in the brain. The *Limitless* experience ( $M_2$ ) urges us to question the naïve, one-sided conviction that *we are* our brains. The novel incites us to see human achievement rather as a dialectical interplay between individual performance (and its neurological correlates) on the one hand and the broader systemic context (the socio-cultural environment or *world*) on the other. In *Limitless* this insight (that creativity can only be partially explained with the help of neurotransmitters and brain chemistry) is not really achieved however ( $M_2 \rightarrow | M_3$ ). The new designer drug (the materialisation of a new form of neuro-scientific and psycho-pharmaceutical expertise) remains one-sided and disruptive, both individually and more broadly, on the level of culture and society. In the movie version, the power game played by the company, at the expense of individuals (early adopters, notably faltering artists) is neither criticised nor overcome. Eddie the protagonist temporarily succeeds in outsmarting others, but a sustainable moral practice (*Sittlichkeit*,  $M_3$ ) never develops. In other words, the neuro-centric starting-point ( $M_1$ ) is not really challenged and corrected (negated, “sublated”) in response to the dramatic *Limitless* experiment ( $M_2$ ). Various power games are enacted in the course of the trial ( $M_2$ ), but without overcoming the moral and epistemological deficiencies and deadlocks exposed by the novel. By relying on brain doping, the protagonist remains trapped within the logic of a toxic power game, rather than transcending and sublating it, so that the “happy end” remains a temporary, solitary and vulnerable one ( $M_2 \rightarrow | M_3$ ).

The difference between the novel version and the movie version of *Limitless* is quite telling in this respect. In the novel version, the protagonist is literally described as a research subject, a “guinea pig” (p. 244), a “human lab rat who was tagged and followed and photographed and then discarded” (340), so that the idea of the experimental novel must be taken quite literally here. In the movie, however, the role of the pharmaceutical company, whose untested pharmaceutical products facilitate “a sudden and unexplained leap forward” in the early adopter’s career (p. 204), until disruptive side-effects and withdrawal symptoms begin to manifest themselves, blends into the background. The origin of the drug remains more or less unclear. Life is lived in the fast lane and experienced as highly competitive, while pharmaceutical innovations provide shortcuts to success. The protagonist *persists* in this neuro-centric and neoliberal view on what human existence is about ( $M_1$ ), rather than allowing the negativity of this viewpoint to be challenged and negated by his experiences. The strength of the novel, compared to the movie (from a dialectical perspective), is that the initial convictions are really called into question, on three levels, namely on the level of *knowledge* (the epistemic level), of *power* (the biopolitical level) and of the Self (the ethical level). On the knowledge level, the novel challenges the neuro-centric view on human creativity, a view which frames society as a pharmaceutical laboratory where consumer responses to brain-chemicals can be tested by companies. On the level of *power*, the novel problematizes the unequal power relationship between pharmaceutical companies and consumers (early

adopters) of designer drugs. And on the level of *Self* it becomes clear that the various tensions and conflicts described by the novel can only be addressed when the challenges are really *worked-through*, so that egocentricity and opportunism (of individuals-as-entrepreneurs) give way to the development of a sustainable, collective, moral culture which is able to stand up to and domesticate the toxic novelty ( $M_3$ ).

These three dimensions or axes, namely *knowledge* (epistemology), *power* (biopolitics) and the *Self* (ethics) will assume a broader relevance in this study. They indicate three types of questions that may be asked concerning research misconduct, namely: Which new forms of knowledge (of scientific technicity) are emerging? How do they affect power relationships or established power regimes? And finally: What practices of the Self are developed in response to this challenge? These three axes of research (these three types of questions) have been distinguished by Michel Foucault (1984; cf. Zwart 2016c), but prove highly relevant for a dialectical approach as well. A dialectical process is unleashed when new forms of *knowledge* (epistemic novelties) emerge. In the case of *Limitless*, these novelties initially exemplify and reinforce a bio-molecular, neuro-centric view on human creativity, as we have seen, which is *exposed* by the novel ( $M_1$ ). In accordance with the neuro-centric viewpoint, experiences of stagnation and frustration (such as a writer's block) are addressed with the help of substances like MDT-48, allegedly allowing the protagonist to modify his brain chemistry. A decidedly neuro-centric self-understanding is entailed in this scenario ( $M_1$ ). Rather than seeing ourselves as *existing* beings, as beings-in-the-world, MDT-48 reinforces the conviction that we *are* our brain, that our brains are makeable and that our societal performance, our moods, our intelligence, our productivity and our creativity are functions of a modifiable brain. In other words, rather than being the autonomous *subjects* of our performance, human beings become the targets of bio-molecular interventions.

As soon as this new type of biomolecular and psycho-pharmaceutical knowledge, exemplified by the designer drug, enters the real world of socio-cultural infrastructures, however, various kinds of tensions and conflicts emerge and various kinds of ambiguities are revealed. The psycho-pharmaceutical novelty produces disruptive *power* effects ( $M_2$ ). Although the protagonist enters a stellar career, he becomes increasingly dependent on the pharmacological substance, the miracle drug, provided by a powerful company which surveys and monitors his performance, using him as a research subject in an informal (wild) trial. In the movie it is suggested that, in our increasingly competitive, high pace and information-dense societies, performativity can no longer be achieved without the use of nootropic drugs (brain doping), allowing us to enhance our moods and information-processing capacities. It is suggested that virtually all "high performers" (especially in competitive environments such as Manhattan) are on MDT-like drugs. In other words, individuals become the targets of bio-power, of manipulation and surveillance by a Big Other.

But *Limitless* also has repercussions on the level of the Self. Psycho-pharmaceutical innovations are initially envisioned as instruments that allow us to realise certain goals which otherwise would be beyond our reach (in this case: novel