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),[1] 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 Halffman 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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[1] 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.[2]

Seven FFP novels have been selected for this purpose,[3] 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

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[2] http://www.springer.com/series/6230

[3] 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 psychanalysis 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 the 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_3).

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[4] 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_1, M_2 and M_3. 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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[4] 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_1), which is subsequently challenged: *Sed contra est* (M_2), so that a tension unfolds between contradictory positions, leading up to a more robust conclusion, on a higher level of comprehensiveness (M_3).

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 περίακτοι 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 short-cut, 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 ($M_2 \rightarrow \mid M_3$). 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 ($M_2 \rightarrow \mid M_3$).

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* (bio-politics) 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

writing). Subsequently, however, the relationship between the (allegedly autono-mous) Self on the one hand and the technological novelty on the other is bound to change. The subject (the protagonist) becomes increasingly dependent on his pill, his instrument (ὄργανον). His organism, his brain chemistry can no longer do with-out. Moreover, his brain, his whole organism, becomes significantly and irreversible affected by (and addicted to) the drug. In other words, whereas initially the novelty (MDT-48) allegedly allowed the protagonist to become the manager of his brain, of his creativity, his moods, etc., gradually the designer drug becomes increasingly powerful and threatening. The protagonist no longer experiences himself as master over his own brain and the focus inevitably shifts to the question: how to domesti-cate this drug? For the real *agent* of the novel seems to be the (colourless, almost immaterial) drug itself (in Lacanian algebra: the object *a*), *drawing* the protagonists into action.

Initially, moreover, all this seems a purely individual challenge (how to prevent or counter-act addiction, nausea, memory loss, etc.), but gradually it becomes clear that the domestication of MDT-48, exemplifying a whole new wave of psycho-pharmaceuticals, requires a socio-cultural transformation, the development of a new moral culture (*Sittlichkeit*, M_3), sufficiently robust to withstand the massive intru-sion of designer drugs. In other words, MDT-48 actually opens-up and reveals a whole world of contradictions and tension within highly advanced capitalism in which individuals struggle for survival. This raises the question whether more via-ble (less drug-dependent) practices of the Self allow individuals to safeguard their autonomy and to contribute to a turn or conversion (μετάνοια) on the collective level of *Sittlichkeit* ($M_2 \rightarrow M_3$).

The question for the protagonist therefore is how to constitute himself as an autonomous and responsible subject, vis-à-vis the biotechnological and bio-political challenges enacted in the novel. Whereas designer drugs allegedly allow individuals to manage their cognitive capabilities and moods, in the course of the narrative the question rather becomes reversed: how to manage, how to domesticate these prod-ucts of neuro-biochemistry (allegedly benign, but actually quite toxic)? Initially, the basic objective of such drugs is to allow us to manage the bio-molecular processes occurring within our neural networks. But this entails a naïve, neuro-centric and instrumental view on technology. The new challenge is: *how to domesticate com-mercial neuro-biochemistry*? The issue shifts from managing our brains to govern-ing pharmaceutical industries, so that pharmaceuticals not only become *bio-compatible* (enhancing rather than disrupting our psychic well-being), but also *socio-compatible* (optimising rather than endangering daily existence and societal culture). Instead of being socially disruptive (via the intensification of drug-dependent competitiveness), new forms of neurological knowledge must be mobil-ised in such a way that they may be *used by us* rather than the other way around. In *Limitless*, the designer drug is like a bio-technological (man-made) vampire virus, *using* human individuals as mere vehicles in order to proliferate and spread.

In other words, the designer drug operates as a socio-cultural infection. Agency increasingly shifts from human users to the super-pill itself. Containment of this infection can only be realised collectively, but *Limitless* describes a socio-cultural

landscape where this "third moment" (M_3) remains decidedly out of reach. The question how to effectively domesticate designer drugs also applies to other "converging" NBIC technologies (where NBIC stands for: nano-technologies, bio-technologies, information technologies and cognitive science). The question is not whether such novelties will *either* lead to empowerment of individuals *or* to increased drug-dependence, for the most likely scenario is: both. This is the paradox of the "second moment" (M_2): the autonomy of the protagonist is *seemingly* strengthened, but actually it is a lure, because before long the subject becomes increasingly dependent on "his" drug. Increasingly, moreover, the designer drug affects the socio-cultural arena, seducing other potential consumers (use me!), occupying the position of *agent* addressing and seducing potential consumers (rather than being a mere instrument). The drug (a neuro-chemical substance) represents power-relationships moreover: a pharmaceutical company recruiting early adopters as informal research subjects, using their personal experiments are a source of information. With the help of the drug, the protagonist aims to restore performativity, but actually he becomes a research animal, a lab rat, while Manhattan *as such* becomes a neuro-pharmaceutical laboratory or test site. Before long, the pharmaceutical company knows more about Eddie's brain than Eddie himself. Eventually, the gap between expectations and performance is intensified rather than bridged by the drug. The dialectical question therefore is how to restore *Sittlichkeit* on the macro-level: a moral culture or scaffold (M_3) which enables individuals to survive exposure to such infectious, toxic substances; both enabling and building on viable practices of the Self. The development of such a culture presupposes that questionable practices on the part of pharmaceutical companies (flooding the market with designer drugs, life-style drugs, anti-depressants, ADHD-drugs, etc.) is exposed and addressed (Dehue 2015). Let this suffice as a first example of how a novel (analysed from a dialectical perspective) may inform the debate. I will now turn to Lacan's second source of inspiration, namely Freudian psychoanalysis.

1.5 Freud and Fraud

In discussions on research misconduct, Freud's work may be addressed from multiple perspectives, for in the course of his career he played various roles, as a scientific researcher, as a physician specialised in psychic afflictions, and as the founding-father of psychoanalysis.

Initially, Freud was a scientific expert: a neurologist trained at the University of Vienna who qualified as doctor of medicine in 1881 and became a specialist in the treatment of patients labelled as hysterics and neurotics. As a neurologist, he contributed to what Jacques Lacan refers to as "university discourse" (a concept that will be discussed in more detail in the next chapter), notably via his neurological publications on aphasia and the brain.

Dialectically speaking one could argue that, as a researcher, and subsequently as a trained and qualified practitioner, Freud's basic aim (on the level of *knowledge*)

was to contribute to the realisation and elaboration of the neuro-physiological world-view (M_1); initially as a researcher involved in experimental work, but subsequently as a practitioner working outside academia and focussing on "neurological" afflictions such as hysteria and compulsion neurosis. Yet, inevitably, he encountered weird obstacles and experienced frustrations of various kinds (M_2). On the *knowledge* level, he faced tensions and contradictions between his epistemic convictions and his practical experiences. The latter seemed to challenge or even "negate" the neuro-physiological paradigm in which he was trained. In his efforts to deal with these complexities, he increasingly began to explore new terrains. In 1897 (the birth year of psychoanalysis), this resulted in a scene-change. The περίακτοι of his practice was reversed, as the laboratory setting had already given way to the famous Freudian couch. But rather than representing a deflection from his scientific convictions, Freud consistently emphasised that he wanted to reconcile the two by addressing emerging therapeutic challenges in a scientific manner, so that the apparent tensions between neuro-physiology and psychopathology could be sublated (*aufgehoben*). Although his scientific convictions seemed to be *negated* by his experiences as a physician, his aim was to achieve a *negation of the negation* and to reconcile neuroscience and psychotherapeutic praxis (M_3). He saw psychoanalysis as an extension of science and expected that, one day, psychoanalysis could be confirmed by (or even replaced by) endocrinological and neurological views (Freud 1920).

This dialectical schema mirrors Zola's concept of the experimental novel discussed above. Freud likewise sets out to bridge the gap between the scientific and the literary world, between the novel (as a literary case history) and the experimental method (as a basic form of scientific experience), albeit starting at the opposite end. For whereas Zola was a literary author who recognised the possibilities of the scientific method, Freud was a scientist who recognised the relevance of belles-lettres. It has been observed that Freud's case histories actually read like novels (Marcus 1974/1985). While Zola the novelist adopted experimental concepts and techniques in his literary writings, Freud at a certain point decided to employ novelistic techniques to further develop his understanding of human psychic existence. Point of departure was a model of the human mind elaborated in an unpublished manuscript known as the *Entwurf*. In order to reconcile the tensions between his neuro-scientific theory (the *Entwurf*-model) and his psycho-therapeutic practice (M_2), he not only began to *analyse* novels and theatre plays, but also actively began to *write* novel-like case histories himself ($M_2 \rightarrow M_3$).

Thus, Freud developed a unique discursive practice, compared to standard university discourse. Initially, Freud was a qualified expert who aimed to *apply* the theoretical and methodological requirements of the neuro-physiological paradigm to the empirical complexities of psychotherapeutic practice, but this proved an unsolvable challenge ($M_2 \rightarrow | M_3$). In response to his fiasco, he moved away from explanation to interpretation, from causality to narrative, from science *strictu sensu* towards the humanities, realising a science-humanities dialogue. Freud-the-qualified-expert had been a neurologist who basically regarded the bodies and brains of human individuals as *objects* or targets of research. Freud-the-psychoanalyst, however, took a different perspective. Notably in his extended case

studies (*Dora*, the *Ratman*, etc.), the patients themselves are now given the floor as *subjects* and invited to articulate their inhibitions, fixations and desires, via free associations (automatic speaking) and transference. In other words, Freud as an author produced two different types of discourse: *before* the birth of psychoanalysis he published scientific papers (on aphasia and neuro-anatomy), but after the epistemological turn or rupture (occurring in 1897) he began to publish case histories, together with meta-psychological considerations based on them (from 1897 onwards). And only his psychoanalytical output is included in the standard editions of his *Gesammelte Werke* or 'complete' works.

In his role as a professional expert (i.e. a neurologist who tried to extrapolate his convictions into psychotherapy, who tried to *realise* his science), Freud faced a number of integrity challenges. As a medical practitioner who became a psychotherapist, his dealings with patients were far from flawless, and some (questionable) activities have been amply documented, first and foremost by Freud himself. One of them concerns the so-called cocaine episode. In 1884, Freud developed an interest in possible medical applications of cocaine and published an article advocating the drug as a panacea (although he lost the race for priority against ophthalmologist Carl Koller, who demonstrated the surgical use of cocaine at an ophthalmological congress that same year; Gay 1988, p. 43). Meanwhile, Freud had started to use the drug himself, as a remedy against depression and impotence, and he recommended or prescribed it to a number of patients and friends. One of them was Ernst von Flieschl-Marxow, who quickly became addicted to it, so that the remedy actually exacerbated his sufferings. Cocaine proved a φαρμακόν: both remedy and poison. Other physicians reported that the drug (if subcutaneously injected, as Freud suggested) could have rather unfortunate side effects. This troublesome episode damaged his professional reputation and became a topic in his dream life. Some cocaine-related dreams are reported and analysed in *The Interpretation of Dreams* (1900/1942).

The most famous dream analysed by Freud, and the one that is generally regarded as the prototype of Freudian dream analysis, is *Irma's injection*, a dream which likewise reflects embarrassing experiences as a medical practitioner. In this dream, which was dreamt on the night of July 23, 1895, Freud meets a former patient (pseudonym: Irma) who suffers from unexplainable symptoms. He asks her to open her mouth and peers curiously into her throat, where he notices a strange white spot. Three colleagues join the examination and after some deliberations they conclude that the suffering is caused by an iatrogenic *infection*, resulting from a (rather carelessly administered) *injection* with a "solution" named *Trimethylamine*, whose formula appears before the dreamer's eyes, printed in bold type. Freud's subsequent interpretations reveal that the dream indeed addresses an instance of questionable professional practice. Via his dream, Freud argues, the dreamer (Freud) tried to exculpate himself at the expense of colleagues.

The practical experiences reflected in this dream are well known. In March 1895, Freud treated a young single woman named Emma Eckstein (27 years old) for hysterical nose bleeds and called in the assistance of his friend Wilhelm Fliess, a nose and throat specialist (otolaryngologist) from Berlin, to examine her. Inspired

by idiosyncratic theories about the role of the nose in sexuality, Fliess operated on Irma's nose on March 4, but this did not stop the bleeding. To make matters worse, a foetid odour set in. As profuse bleeding continued, Freud called in another surgeon who discovered that Fliess had left at least half a metre of gauze behind in the nasal cavity. In a letter to Fliess, Freud commented that it was an unfortunate accident that could have happened to the most careful surgeon. These instances of carelessness or even misconduct clearly troubled Freud and affected his dream life.

All these experiences were part of the transition period, when Freud was still combining his budding improvisations as a psychotherapist with biomedical interventions, such as cocaine injections and surgery. But the crucial, formative *experience* gained during this period (M_2) was that neuro-physiological theory on the one hand and the realities of hysterical and neurotic suffering on the other seem impossible to align in an adequate way, so that he eventually deflected (as a neuro-physiological apostate) into a fundamentally different kind of praxis: psychoanalysis, relying on extended, novel-like case histories, yet persisting in the expectation that eventually science and narratives, experimentation and interpretation would be reconciled ($\rightarrow M_3$).

As a psychoanalyst, however, he again faced various integrity challenges, albeit of a different, *textual* nature. They were related to authorship and had to do with handling sensitive information. His shift from physical examination and biomedical intervention into interpretation and case study analysis is also reflected in the type of integrity dilemmas he is now facing, revolving around issues concerning the question whether it is admissible to publish sensitive, confidential information about patients in academic papers.

One relevant episode, from the point of view of research integrity, concerns the so-called Dora-case, the first extensive psychoanalytic case history published by Freud (1905/1942). The case study *as such* is an exemplification of psychoanalytical discourse. It is a *Fallgeschichte* which indeed reads like a "novel" (Marcus 1974/1985),[5] and the patient herself is given the floor as the key protagonist, while Freud acts as the narrator who (as one of the characters in this "novel") narrates the story in retrospect. To this famous case study, however, a *Preface* is added, which is written in a somewhat different discursive mode. In this *Preface*, Freud poses as a professional doctor who writes *about* a patient and who discusses his moral dilemma concerning the confidentiality principle before an audience of medical colleagues (Zwart 1992, 2016b). From a literary perspective, this may be regarded as a "framing action" (Marcus 1974/1985, p. 67). In his *Preface* he admits to publishing this document (which contains a significant amount of intimate personal details concerning his former patient) without the patient's consent, arguing that patients would never opt for psychotherapeutic treatment if they suspected that confidentiality could thus be broken. Freud claims, moreover, that his duties as a scientist (to share his findings, so that future therapists and patients may profit from the insights

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[5] Steven Marcus, reading *Dora* from the point of view of literary criticism, argues that Freud's case study reads like a "modern experimental novel" (p. 64) and that he writes "exactly like a novelist" (p. 68).

gained) have to be given more weight than his discretional duties towards single patients.

According to Freud, professional therapists find themselves in an impossible position, facing an insolvable integrity dilemma. When they refuse to provide details from their therapeutic practice, medical colleagues will complain that their theories are unfounded. But when the data are provided, these same colleagues argue that he should not have done this, in the light of the principle of confidentiality (p. 163). In other words, the expert is confronted with a clash between methodological norma- tivity (always provide the necessary details in support of your theory) and ethical normativity (be a Victorian gentleman and treat confessions about intimacies made by patients, notably female patients, with the utmost discretion). But if he had asked his patient for her permission to publish such intimate details, she certainly would not have given it (p. 164). Moreover, Freud took care to conceal Dora's identity, notably by using a pseudonym, but her identity was nonetheless discovered of course (cf. Kochiras 2006). Regardless of whether contemporary readers find Freud's line of reasoning convincing (probably not), this *Preface* is written in a professional rather than a psychoanalytical vein, so that in terms of discursive mode it contrasts with the case history as such. The *Preface* is written by Freud-the- professional-expert, rather than by Freud-the-budding-psychoanalyst.

Other integrity aspects of Freud's psychoanalytic practice have likewise aroused uneasiness or criticism. This includes reproaches concerning "therapeutic nihil- ism", meaning that, although psychoanalysis aims to foster self-understanding, it often fails to actually cure the patients from their psychic afflictions, notably because these afflictions tend to reflect fundamental entanglements with the socio-cultural environment as such, and are therefore seen as symptomatic of (Western) civilisa- tion as a whole. But such criticism basically concerns Freud in his role as a profes- sional, a therapist. In this introductory Chapter, the focus of attention is not in the practices of Freud-the-professional-expert (evidently questionable at times), but rather on the concepts and methodologies employed and on the insights gained by Freud-the-psychoanalyst, such as his concept of 'impossible professions'.

1.6   Scientific Research as an Impossible Profession

One example of a concept coined by Freud-the-psychoanalyst that seems highly relevant for our purposes is the concept of "impossible professions" (Freud 1925/1948; 1937/1950, p. 94). Reflecting on some questionable aspects of his per- formance as a therapist in retrospect (such as the ones described above), Freud argues that his predicaments are attributable to the fact that therapy, together with pedagogy and governance, should count as an "impossible profession". Given the basic tensions inherent in the practices concerned, unsatisfactory results are to be expected from the very outset.

Jacques Lacan subsequently extrapolated this concept to include scientific research as a fourth instance of an "impossible profession". According to Lacan,

this notably applies to scientists who nowadays work with dangerous and potentially toxic or infectious objects, such as nuclear energy or potentially dangerous bacterial strains. In view of the dilemmas involved, Lacan argues that researchers are struggling with a "crisis of anxiety" (1974/2005, p. 74). They are alarmed by the idea that dangerous life forms may one day escape from the laboratory, causing pandemics in the outside world, perhaps even cleansing the world from human beings. In some cases, this may cause researchers themselves to adopt a self-imposed moratorium, as happened in the case of recombinant DNA research in the 1970s (Berg et al. 1974; Zwart 2013). In other words, scientific research has become an "impossible profession" (Lacan 1974/2005, p. 73).

Dialectically speaking, this experience is part of the second moment (M_2) of the dialectical unfolding: the moment of negation or negativity, when contradictions (the clash between the desire to know and the various constraints implied in the societal responsibilities of a scientist) may seem impossible to solve. Initially (M_1) it seems evident that scientists work for the benefit of humankind and that scientific knowledge may be used to address societal issues. But gradually (M_2) it becomes clear that science itself may become a danger, a *problem*, rather than a solution, because *science itself* may entail significant societal risks. Nonetheless, from a dialectical perspective, it would be nihilistic to conclude that this experience (relevant as it is) must be regarded as the final outcome. Somehow, we must *work through* the challenges (the symptoms of the crisis) and *negate* the unexpected negativity of science, thus opening-up a more viable plateau of activity, where science and society may become reconciled again (M_3).

In all the novels analysed in this monograph, the experience sooner or later emerges that scientific research may indeed entail potentially disruptive risks, so that scientific research should indeed count as an impossible profession, given the integrity challenges which researchers are facing and which seem impossible to solve. But this *experience* inevitably raises the question how the situation of paralysis and deadlock (M_2) may eventually be overcome (the negation of the negation: M_3). In practice, this envisioned dialectical end-result (M_3) may prove difficult to achieve however. The experience of science as an "impossible profession" may give rise to less optimal scenarios and may imply that scientists, exposed to (unsolvable?) integrity challenges, revert to questionable research practices or even misconduct, in order to by-pass (rather than address) them.

Because of the decisive role of reflections on problematic experiences (the cocaine-case, the Irma-case, etc.) during the gestation and birth of psychoanalysis, as reflected by his dream life as well as by *The Interpretation of Dreams* (Freud 1900/1942), it is remarkable perhaps that on a manifest level Freud speaks about research misconduct in a fairly cursory manner. In *The Psychopathology of Everyday Life*, Freud (1904/1941) discusses a case of *unintentional* plagiarism ("cryptomnesia") he once experienced. After sharing with "a friend and colleague" (Fliess again, but his name is not mentioned) some ideas about the original bisexuality of human individuals, Fliess kindly reminds him that he had been discussing this same idea with him two and a half years earlier, when Freud had actually rejected it. Thus, he suffered a narcissistic insult: he was forced to give up his illusion of originality, but,

he adds: "Since then I have become more tolerant if I come upon one of the few ideas with which my name can be linked elsewhere in the medical literature, and I find that I have been given no credit for it" (1905/1941, p. 160). In other words, lack of acknowledgment (i.e. plagiarism) is the default rather than the exception.

Another key concept in Freudian epistemology is the concept of resistance as a mechanism of defence. From a psychoanalytical perspective, modern science opens up the closed circle (the Platonic cave) of everyday phenomenological experience, revealing a dynamic universe of immense proportions and complexity. For Lacan, the prescientific Aristotelian cosmos was basically a phantasy (Fink 2004, p. 148), revolving around the idea of a pre-established harmony between the *world* (the natural macro-cosmos) and the embodied *soul* (the human micro-cosmos). Modern science, however, relying on quantification and formalisation, gave rise to a universe in which human existence is increasingly de-centred and marginalised. This entails what Freud (1917/1947) refers to as a "narcissistic offence". The egocentric ego (the human micro-cosmos, mirrored by the macro-cosmos) gives way to the marginalised subject of modern techno-science. Modern science represents an initially quite painful and distressing awakening, an epistemological birth trauma. Science disrupts the "poetry" of a traditional, pre-scientific world and invokes anxiety and unease because it entails a diminution of humankind. The world of modern science is so large (in terms of space and time) that humans become trivialised. For Freud, this narcissistic offence explains the resistance against Copernican, Darwinian and other scientific revolutions, which not only confront us with the immensity of the universe but also, for instance, with the existence of a (potentially threatening) microbial world, both surrounding and pervading us. Psychoanalysis likewise represents a narcissistic insult, by revealing that the ego is not the master in his own house, but driven by unconscious desires and hampered by unconscious obstacles.

To ward off the unease triggered by scientific revelations, there is an inherent inclination in human beings to ignore such threats. In *Beyond the pleasure principle*, Freud (1920/1940) argues that, in contrast to views which emphasise human curiosity and world-openness, the human psyche basically functions as an immunisation mechanism: a mechanism of defence, designed to keep the threatening outside world at bay. Although our sense organs allegedly allow us to see and hear the world, their primary task is to ward off and filter disconcerting external signals, allowing only small samples of reality to enter our sensory system. They filter out the information we need and disregard the rest. Indeed, we are equipped with eyes and ears first and foremost because they allow us *not* to see and *not* to hear (Matthew 13:13).

This is underscored by human anatomy. We are almost completely covered by protective skin, in combination with artificial protective layers known as cloths. Our sense organs are miniature apertures, Freud (1920/1940) argues, whose primary purpose is to provide protection against overstimulation (*Reizschutz*). This tendency of humans and other organisms to insulate themselves from the outside world already applies to micro-organisms, coaxed inside their cell membranes. First and foremost, our vulnerable bodies have to be protected against overstimulation.

Protection against external stimuli is a life task at least as important as sensitivity and receptivity (Freud 1920/1940, p. 27). Our sense organs are like little antennae that select small samples of exteriority, allowing us to assess minute quantities of reality. Our primary objective is to safeguard our psychic integrity from external traumas. And this also explains obstinate human reluctance to accept the insights (fairly disconcerting and unsettling at times) produced by scientific research.

In the next chapter I will explain how Jacques Lacan coagulated Hegelian dialectics and Freudian psychoanalysis into a theoretical and methodological framework which allows us to use science novels as oblique windows into contemporary technoscience.