

CHAPTER 11

Bringing the Heroes Back to Earth: Science Journalism with Human Beings

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This essay is an exploration of how narrative science journalism can affect the reader and her view of science. I argue that by triggering the reader's feelings, such journalism may have a strong effect on the reader's worldview and her perception of science and scientists. While many of today's research stories simply present new findings, the narrative genre can add elements such as suspense, empathy, and context. This can unlock deeper insight into research topics and processes. It may also contribute to narrowing the gap between scientists and the public, which may have positive consequences for society. Although writing about science in a narrative style implies clear challenges, I argue that narratives should have their place in today's coverage of science. Using a range of journalistic genres may contribute to a broader, and truer, picture of science.

Keywords: narrative journalism, science journalism, subjectivity, critical reflection

Introduction

We know more about the world than we have ever done before. Still many questions remain unanswered. As Friedman, Dunwoody, and Rogers (1999) point it out in the very first sentence of their book, *Communicating Uncertainty*: “Perhaps the most common outcome of the scientific process is not facts, but uncertainty.”

In the last few years, science stories have flourished in the media. When scientific uncertainty meets news criteria like conflict, sensation, and timeliness, collisions tend to occur. According to Andersen and Hornmoen (2011), 90 percent of the science coverage in Norwegian newspapers consists of news stories, meaning quite short stories following the model of the inverted pyramid that presents the most important news in the first paragraphs. Many of these stories focus on scientific findings. Andersen and Hornmoen have argued that news stories tend to push science into a format with little room for discussion, perspective, depth, context, or engaging narratives. Moreover, the scientist's role is limited; he or she easily becomes the expert who provides the answer.

In this chapter, I will explore a not so common genre in the coverage of science, namely narrative journalism, including characters, feelings, and elements of drama that we are familiar with from fictional literature. I will argue that this genre can make room for new kinds of science stories and new portrayals of scientists, and I will ask what the consequences of this might be. Throughout the chapter I will use an example from my own work, a narrative story published in the documentary magazine *Plot* in 2014, later awarded the “ViS-prisen”, a Norwegian prize for ‘critical, wise, and robust’ science journalism.

Different kinds of subjectivities will be addressed. One concerns my own role as a journalist, what Steensen in chapter 2 refers to as “byline subjectivity”. Another is the subjectivity of the story's characters, and particularly the scientist in the story. A central question is whether the portrayal of scientists can influence the reader's views of science and scientists. Finally, the reader represents the third kind of subjectivity touched upon in this chapter. Without the reader, a narrative would serve no purpose at all.

Method and background

By exploring a less common practice in science journalism, and then reflecting on my experiences, I enter into a methodology of “reflective practice” or “critical reflection”, two expressions often used interchangeably (Fook, 2015, p. 441). According to Jan Fook, this methodology has appeared and developed in various fields, and is basically about narrowing the gap between formal theory and actual practice, and about trying to improve today's practice. Although my aim is not to contribute to fundamental changes in science journalism, I will eventually argue

that science journalism could benefit from narrative storytelling, where the individual has a more central role than in traditional news stories.

Critical reflection will unfold in a dialogue with other scholarly work. I will draw upon theories from fields such as science journalism, literary journalism, and media studies of literature and film, in order to gain a broader understanding of the topics I investigate. After all, both fictional and true stories have been told for thousands of years, and several academics have looked into how people may be affected by them, and why.

The chapter is based on a master thesis in journalism, where I used the same combination of practical experience and scholarly work to look into how narrative science stories may affect the reader and which challenges such journalism may imply.

A scientist in difficulties

In the story published in *Plot*, we meet Giulio Selvaggi, the story's main character, in this opening scene from Bodø, a city in Northern Norway:

Flying into Bodø, Giulio Selvaggi enjoys looking out of the window. He looks down at the u-shaped valleys, formed by glaciers, and at the v-shaped valleys, formed by rivers. He looks at the fascinating white beaches, so far north.

Still, even a man of nature needs a roof above his head. Therefore, on an August day in 2013, he is standing at the top of a ladder, propped against an old wooden house outside Bodø. He holds a paintbrush in his hand. He wants the yellow color to be just as it was before; he will do a good job. His parents raised him to be a responsible person.

This summer day the whole family is painting and gardening: two children, a Norwegian mother, and an Italian father. They spend every summer at this place. However, everything has changed now. The yellow wooden house is no longer a holiday house. It can become their new home. One day they hope to pack their belongings in Italy and travel north for good: two children, a mother, and a father who is convicted for the manslaughter of 29 people (Pileberg, 2014a, *my translation*).

Selvaggi was one of seven academics and public officials convicted for manslaughter in L'Aquila, Italy, in 2012, after what people regarded as misinformation prior to a large earthquake.

Selvaggi was, and still is, a leading seismologist in Italy, but his life changed dramatically after the verdict. When I wrote the piece in 2012/13, I did not know that he would be acquitted in the appeal. He is presented as a seismologist, but also as a husband, a father, and an accused man, with all the pain, insecurity, and anger that involves.

The media often portray scientists as experts, and scholars have claimed that these portrayals may present scientists as heroes, positioned high above other people. Gregory and Miller (1998, p. 23) write that "... the overriding social message of science on television is that scientists always solve the problem, even though how they do so must remain invisible to the public". Nelkin has stated that scientists "appear to be remote but superior wizards, above ordinary people, culturally isolated from society" (Nelkin, 1987, p. 15). Hornmoen (1999) urges journalists to think differently: Journalists should not portray science as a separate culture, as this could create an unfortunate distance between science and the public, he argues.

The story about Selvaggi was part of Pileberg (2014b) in which I attempted to pick up on these issues, and also on what Pulitzer prize winning journalist and academic Jon Franklin in 1986 called *humanizing science*. He believed that by writing stories about science in literary form, journalists could contribute to giving people another view of science. He claimed that such stories could lead to readers feeling touched or even being changed.

About the genre

I will briefly describe narrative journalism and journalistic storytelling. A simple definition of a story is a text that describes a sequence of actions. Often the story has a beginning, a middle, and an end, and it gradually builds up to a turning point. It is told by a voice that is less neutral than what is common in news journalism (Bech-Karlsen, 2007).

Human beings have told stories for hundreds of thousands of years, and there is a long storytelling tradition in journalism. Writers like Daniel Defoe, Mark Twain, and Ernest Hemingway are famous for their non-fiction stories, followed by Truman Capote and Tom Wolfe, who introduced "new journalism" in the last half of the 1900s, also described in Chapter 2 (Steensen's chapter). Wolfe wrote:

[The form] consumes devices that happen to have originated with the novel and mixes them with every other device known to prose. And all the while, quite beyond matters of technique, it enjoys an advantage so obvious, so built-in, one almost forgets what power it has: the simple fact that the reader knows *all this actually happened* (Wolfe, 1973 p. 49).

He also gave names to techniques used by narrative journalists in his time: scene-by-scene construction, extensive dialogue, third person point of view, and detailed descriptions of the symbols of people's status life (Wolfe, 1973).

The narrative form also requires an *action* that works as an engine in the story, and it often portrays human beings' inner lives (Degregory, 2007). This means that the story has *characters*, just like movies or novels, but the characters exist in real life. Stories also often have a "universal truth", which is a deeper message about our lives or culture (ibid. p. 20). Mark Kramer (2007, p. 24) points to the importance of a topic with "emotional temperature".

I am not the first to explore narrative science journalism. Ted Anton and Rick McCourt wrote about "the new science journalists" and said that they belonged to three categories (1995, p. 4): "Those who write in an original style, those who investigate with new zeal, and those who pull together the data of specialized studies to identify important new trends." Hornmoen (2006) argued that literary journalism, in popular science magazines or news media, is commonly reduced to a semi-narrative form with an educational purpose, namely to improve public understanding of scientific knowledge.

The story about Giulio Selvaggi only partly fits into this picture. Selvaggi, the story's main character, is a scientist, but the story does not have an educational purpose in the sense that science results are simplified and communicated. At least that is not the story's main point. Rather, the story strives to dig into the scientist's role and responsibility in society.

Many terms have been used to describe narrative journalism, e.g. "literary journalism", "creative non-fiction", "new journalism", and "new new journalism". These terms share much of the same meaning and I will stick to the term "narrative journalism" in this chapter.

The appeal of stories

Several scholars have claimed that narratives, whether fiction or non-fiction, seem to engage readers, viewers, and listeners in a special way. And several

scholars have tried to figure out why. Even Aristotle, the Greek philosopher who lived 350 years B. C., was puzzled by the number of people who gathered to watch tragedies, which even made them sad! He launched the *catharsis doctrine*, describing the comfort in watching stories where people are worse off than oneself. The doctrine, however, has not gained support in empirical studies (Vorderer & Knobloch, 2000).

Later, several theories have been launched. Oatley (1994) and Polichak & Gerrig (2002) point to how the *incompleteness* of the story triggers an engagement, or a response, in the reader. According to Polichak & Gerrig such responses can include trying to solve the character's problem or, if too late, thinking backwards through the story and making alternative action plans. These responses in the reader can even change her attitudes in real life, they argue. For example, if the story portrays an innocent young girl who is hit by a speeding car, it may make the reader more aware of speed limits.

The latter does not explain, though, *why* we seem to long for suspense and incompleteness. An important factor seems to be stories' ability to give us experiences and feelings that we do not have in our own lives. Zillmann (referred to in Vorderer & Knobloch, 2000, p. 66 –67) launched a theory about "excitation transfer", where the reader feels an increasing excitement towards the turning point of the story. Then, after what he wished for has happened, the positive feelings intensify. Zillmann assumes that this condition, which is triggered in particular by stories in which heroes conquer enemies and challenges, has its own deliberating effect on people.

Both Zillmann and other scholars have stated that stories can give us big and intense experiences while we sit safely in our homes. In a narrative world we can experience simulations of alternative personalities, realities, and actions, and it does not cost us anything. In this way, we do not have to change our jobs, wives or husbands in order to understand what it is like, we can just read a story (Green, Brock & Kaufman, 2004). A prerequisite is that we are submerged into the story, either by what Tellegen (1982) named "absorption", or by what Green & Brock (2000/2002) named "transportation". These two are quite similar, while absorbed the reader is still aware of herself and the world around her, it just assumes another form. However, if a reader is transported, she gets carried out of this world and into a story. She becomes fully engaged in the story world (Green, Brock & Kaufman, 2004).

Stories can humanize science

In 1986, the Pulitzer-winning journalist and scholar Jon Franklin wrote about humanizing science through storytelling. This is not something that scientists usually long for, according to Franklin:

The scientists want us to ignore the drama that proceeds in his laboratory, and, more important, in his mind. He denies that he has feelings about salamander tails and that he hopes for things and dreams of things [...]. And yet these characteristics make him human, make him real. They make his efforts, his frustrations, and his mistakes interesting and understandable. And *dramatic* (Franklin, 1986, p. 144).

Jon Franklin claimed that by using literary techniques, the journalist can add emotion to science stories, which in turn could lead to people feeling touched or even being changed.

According to narrative theories this is not unlikely, and *identification* might be a keyword. Cohen (2001, p. 247) describes identification in this way: “Identification requires that we forget ourselves and become the other [...]” This reminds us of what Freud, Wollheim and Bettelheim wrote decades earlier, that identification is an imaginary experience where a person gives up the awareness of his own identity, and experiences the world through someone else’s eyes (referred to in Cohen, 2001). Still, identification has proven difficult to conceptualize. In media studies it is often mixed with other concepts, such as liking a character or being similar to him, but these conditions require that the reader is self-conscious (Cohen, 2001).

Vorderer & Knobloch (2000) argue that identification does not fully describe what happens to an audience reading a story; they claim that *empathy* is a better word, as suggested by Zillmann (1994, p. 40). They argue in this way:

Usually the viewer or reader keeps clearly in mind the distinction between his or her person and the character in a drama. Very often cues in the drama will prevent the audience from feeling as the protagonist does, through information that the protagonist does not have (Vorderer and Knobloch, 2000, p. 64).

Vorderer and Knobloch believe that empathy can explain some of what happens when a reader is submerged into a story. The reader observes the character and either applauds or condemns his actions and intentions. If she applauds, the character becomes a kind of friend, or hero, for the reader. If, on the contrary, she condemns the character’s actions, the opposite happens: the

character becomes an enemy. The reader's "verdict" over the character will, in one way or the other, trigger the reader's hope for a positive outcome and fear of the opposite.

Whether you name it empathy or identification, the reader establishes a relationship to the characters in a story, and narrative genres have qualities that make this more likely. Cohen (2001) argues that transportation increases the chance for identification. According to Slater (2002), this also works the other way: The reader's feelings for the characters are essential for the reader's experience of suspense and drama. If the writer succeeds in constructing a credible main character, and if the reader views the main character as similar to himself or the person he would like to be, this can lead the reader to experience the world through the character's eyes. This again opens up new ways to understand things, and it can lead to a change in the reader's thoughts and actions, writes Slater.

Wied, Zillmann, and Ordman in 1994 (referred to in Cohen, 2001) demonstrated that a viewer's experience of empathy with a character was linked to how much they liked the film. Cohen (2001) therefore views it as probable that a strong sense of empathy or identification makes the viewer or reader like the message of the story more. Slater (2002) supports this; he believes that both the relationship to the characters and the plot or action of the story are important for the reader to get involved in the message, and that such an involvement can increase the message's influence on the reader's actions and attitudes.

Other fields of study also point to the importance of human relations when receiving a message. Dan Kahan and Donald Braman (2006) argue that every one of us chooses to listen to, and trust, people who share our basic values, and with whom we can identify. This is part of the so-called "cultural cognition theory" which has gained attention among communicators of climate and risk science. Based on this theory we can argue that humanizing scientists can lead to more people trusting them; the prerequisite is that they prove to have qualities and values that the reader recognizes.

The processes are not crystal clear, but several studies point to the importance of the relationship we establish to characters in a story or the sender of a message. This may affect our experience of the story, our actions in our own lives, and our understanding of the world we live in. Although most of these theories describe fictional narratives, studies suggest that non-fiction narratives affect the reader in the same way, as mentioned earlier. It may seem like

Jon Franklin was right when he wrote that humanizing science has the potential to *touch* or even *change* readers.

Subjectivity in the earthquake story

In this story, the reader meets the Italian seismologist Giulio Selvaggi and his Italian-Norwegian wife Ingrid Hunstad. Selvaggi had received a serious verdict. In short, he and six other scientists and public officials were convicted after being accused of calming down the citizens in the days prior to the earthquake in L'Aquila, 2009. After a series of smaller earthquakes in the area, people feared a more devastating earthquake and desperately wanted advice about what to do. In this seismic zone there was a long tradition of bringing blankets to a piazza and sleeping outside in such periods, but after what people understood as advice from the experts, many chose to sleep in their homes. This became their doom.

The story was full of emotions. Entire families had been eradicated. Many were children. One of the persons I interviewed and who is portrayed in the story, had lost both his wife and his daughter. The pain was overwhelming. There was also a huge debate about whether the scientists were guilty or not guilty. In the end, this became a story about a scientist and his wife, both in an extreme situation. But it was also a story about a father and a mother; a man and a woman. They were sympathetic, reflective and kind, qualities most of us appreciate. In addition, it was a story about responsibility; about what society may expect from you when you possess specialist knowledge. Lastly, the story raised questions about justice and injustice: What the survivors viewed as justice – namely the verdict – was viewed as incredibly unjust by those convicted.

Writing a story that is full of emotions and controversy is challenging. What was right and wrong was not clear. Lives had been lost. Could the scientists have done a better job of informing about the earthquake risk? The opinions were split, but one misunderstanding was clear: The public had expected more answers from the experts than they were able to provide. People in L'Aquila wanted predictions of the future. Unfortunately, reassuring messages were conveyed through the media, though not by the scientists themselves. Later the experts did not agree on having reassured anyone. Myself, I clearly saw the complexity of the situation, and felt strong empathy with both sides, but after

investigating it I also got the feeling that the verdict was not right. Throughout the writing process this gut feeling continued to follow me, and some readers may experience the story as biased.

A story being regarded as subjective is not uncommon in journalism. Although objectivity has been held up as a journalistic ideal, scholars have argued that objective news journalism does not exist. Njaastad (2012, p. 91) claims that the personal opinions of the journalist, editorial opinions, and factors regarding the specific story – e.g. which sources being used – will always prevent journalistic objectivity. Still, he argues that “the unattainable ideal is still worth striving for”. The journalist must strive to be thorough, accurate, balanced, holistic, relevant, and significant. These are central journalistic aims and should be important to strive for in all journalism.

When we look at literary tradition, narratives are more open to subjectivity than news journalism. Hartsock writes: “The subjectivity of the literary journalist must take a more active role in the composition of the report in comparison to the relatively more submerged role implicit in the abstract nature of objectified journalism” (Hartsock, 1998, p. 63). According to Hartsock, subjectivity is necessary if the narrative journalist shall succeed in what Trachtenberg named an “exchange of subjectivities’ through the use of rhetorically ‘felt detail’” (Hartsock, *op.cit.*, p. 63). In other words: In order to trigger your reader’s feelings, you need to convey a human message.

The presence of subjectivity in narrative journalism is also emphasized in other chapters in this book. Steensen writes about byline subjectivity and source subjectivity, both being strongly present in narrative journalism. While the first refers to the journalist’s own experience, the second refers to the source’s subjectivity. Steensen writes that the journalists who wrote new journalism aimed to get involved, to be participants, in order to create a “truer” journalism, in line with existentialist ideas.

In my own work, I was strongly aware that I had two roles: I was a journalist, and I was a human being. I had to make a long list of choices: Who would be the main character? Which message do I wish to convey? Which voices and thoughts should be heard, and which voice should be used by the storyteller? I knew that these choices can lead the reader’s empathy in a certain direction, and even result in attitude changes. I also knew that I was covering a controversial case. All this requires an awareness of responsibility and ethics. I had to be aware of Njaastad’s advice and ask myself: Is this a significant story

to tell? Have I done a thorough job? Is what I am writing true? Still, I knew that the story would contain a large degree of subjectivity; both byline and source subjectivity. I could write a story that reflected reality, but I would not be able to write a story that reflected *all sides* of reality equally. It is a constant challenge for journalists: *We do* have considerable power; we get to choose which sides of reality to reflect.

I chose Selvaggi as the main character. His wife is also an important character in the story. Since narratives allow scenes and using a third person point of view, the characters' views are presented in passages like the following, from September 24th 2012:

A tall, blond woman sits in a courtroom. The accused is her husband, Giulio Selvaggi. On her first time in a courtroom, May 30th, she watched him take the witness stand. She was so nervous for him that she could not write. Today she will. Their daughter, Liv, has lent her a notebook. For Ingrid Hunstad writing is a way to escape from her thoughts.

It feels so embarrassing to be there. They, of all people. They, who through all their adult lives have been working for the good cause; for a greater understanding of how earthquakes hit. Today they should have been on the other side, together with the victims. How wrong it feels that the victims sit there scowling at her; that they see her as the wife of a killer (Pileberg 2014a, *my translation*).

The simple fact that Selvaggi is the main character, and his wife the second, increases the chance of bending the reader's empathy towards him. In order to have a more balanced story, I was careful to use a variety of sources. One important choice was to let one of the victims tell his version of the story. He was in the most terrible situation, having decided that his family should spend the earthquake night in their house. As a result he lost his wife and daughter. He blamed himself, and he blamed the experts for what he regarded as advice.

Another way to have a more balanced story, is to add context, so that the reader can form her own opinion. I added context both to the story itself and to smaller texts next to it. After communicating with the editor, I added even more context, and more sources, than what was the case originally. Still, it remained a piece with a high degree of subjectivity. Without subjectivity, this story would not exist in the first place.

Goodbye, heroes

As mentioned earlier in this essay, scholars have cautioned against the heroic pictures of scientists that might be the result of traditional science news stories. Still, these arguments were presented in the 1980's and 1990's, and in my search I have not found much new literature on the topic. It may be natural to assume that our view of scientists has changed along with rapid changes in the media in general.

However, according to studies from various countries, where people have been asked to draw their image of a scientist, there are still strong stereotypes. In an interview with *New Scientist*, former BBC science journalist Quentin Cooper pointed to such depictions remaining unchanged for 50 years (Highfield, 2011). One study was conducted in Greece (Christidou et al, 2010); 171 young students' drawings indicated that their view of both science and scientists was quite outdated. For instance, scientists were most often depicted as male, working within STEM disciplines such as mathematics and technology, and they were wearing a labcoat more often than what is common in real life. Still, the authors noted that the drawings were a bit less stereotypical than what had been seen in former studies. Most likely, there have been some changes in the public's view of scientists, but there is evidence that stereotypes of scientists are maintained.

To refute these issues, Hornmoen argues that elements of personal characteristics should be seen much more often than what is the case today:

This is not only because it may give the reader or listener a necessary closeness to the material. It is also about making it clear that science is a human activity, that scientific studies in crucial ways are colored by the humans taking part in them. (Hornmoen, 1999 p. 218, *my translation*).

Also climate scientist Stephen Schneider pointed to the fact that science is based on values: "Values creep into virtually everything", he writes in a discussion. "For a scientist, the best way to deal with a value question is to do it explicitly. Try to know what your biases are and put them out in the open" (quoted in Boffey, Rodgers and Schneider, 1999 p. 89). Here, the science journalist can contribute.

I do believe that stories like the earthquake story contribute to painting a broader picture of scientists. In that story, the scientist is a man who did not

fulfill society's expectations. He is not a hero, but rather a human with limitations and no ability to predict an earthquake, just like the rest of us. In the media, there have also been other stories portraying scientists as humans, for instance the story "He Felt Worthless" (Berg, 2009, *my translation*), in the Norwegian newspaper VG. Here, we get to know medical scientist Jon Sudbø, who was caught cheating three years earlier. Berg spent two years trying to get Sudbø to talk to him. When he succeeded, he wrote a story with elements from narrative journalism, where the scientist is presented as a human being admitting his sins. Such stories are rare, and it is a good example of science journalism that is both critical and humane at the same time.

I believe that humanizing science can have positive effects. It can allow identification and empathy with the people behind the science, which may again lead to readers changing their views of scientists, perhaps seeing them more as humans and less as pure experts. In other words, narratives can make it clearer that science is a human activity, marked by the humans who perform it. This perspective can be an important addition to news stories focusing on scientific findings. The reader of a narrative may also experience science more from the "inside". The distance between the "people" and the science institutions, may diminish. However, when our feelings for the main characters – for example the scientists – are colored by empathy or identification, this can make us less critical towards the messages in the story (Slater, 2002). The journalist should keep her critical sense and be aware of her power.

Humanizing science, as I see it, does not necessarily involve portraying scientists. It can also involve portrayals of people that are somehow affected by science or people involved in scientific work. As long as the journalist succeeds in finding elements that can add feelings to the story, we can talk about humanizing science. There is a wide range of stories that can contribute to broadening our view of what science really is, and bring it closer to our own reality.

Pros and cons of narrative science journalism

Writing about science in narrative style has its pros and cons. Such a story may be a better read than a news article, and since these stories are often longer than a news story, they can add more context and give a broader picture of what's going on. They can also contribute to a deeper understanding of what science really is. However, this also begs several questions. Is it really

important that people have a knowledge of science? And, will not the criteria for the narrative, just like the news criteria, force science into a format where it does not necessarily fit? I will briefly examine these questions below.

It is safe to assume that a basic knowledge of science and scientific processes is a positive thing, for individuals, democracy, and policy. There is more than one reason for that. Increased knowledge does not necessarily make people more positive towards science. On the contrary, Gregory and Miller (1998) argue that more knowledge makes us more critical. We learn that science is a human activity, not the job of oracles. If the gap between scientists and the public is narrowed, this can also lead to improved knowledge production as it is quite likely that scientists can learn from other people. For instance, Meyer (2006) has argued that scientists do not have a monopoly on common sense. It is indeed possible to imagine that increased knowledge sharing, in all directions, in turn leads to better and more informed decisions, in science, policy, and other fields.

Both source subjectivity and byline subjectivity can make the reader see the world differently. Perhaps the reader's world will look a little more like the world seen by the main character or the journalist. Awareness can be passed on, or opinions shared. As long as the story is truthful, and the journalist does thorough research, this can strengthen a story. When the reader sees the world through someone else's eyes, she may gain deeper insight. The Norwegian journalist Berit Hedemann expresses it this way:

As I see it, insight differs from understanding, insight is characterized by filling the body just as much as the brain, insight is "total" understanding. The understanding of a phenomenon, a causality, an institution, can be gained at universities. Insight can rarely be gained by studying. We gain insight through people, experiences, and relations. Insight implies a deeper understanding of complicated circumstances and relations. It changes our feelings and our actions (Hedemann, 2006 p. 21, *my translation*).

The story about Giulio Selvaggi was one of four narrative stories originally written as part of a master thesis, in which I reflected upon issues addressed in this chapter. In that work I realized that there are quite a few challenges in writing narratives about science. For instance, many scientists are used to being portrayed as scientists, not as humans. This can make it hard to enter their personal world. Moreover, ideas for narrative science stories can be difficult to find.

I needed to be patient, both in the process of developing ideas and when reporting. Another challenge occurred while writing the earthquake story: I saw that it can be difficult to cover a controversial topic using narrative techniques. Mixing feelings and subjectivity into a bowl of politics, science, unknown facts, and tragic consequences, was challenging.

Later it occurred to me that these challenges were linked to the framing of science that a narrative requires, just as other genres do. I was searching for faith, hope, and love in a world that can be tedious, professional, and complicated. I did not always find what I was looking for. In addition, making a coherent story out of lots of unknown pieces and fragmented facts, necessarily involves simplification. Although I spent weeks and months on research and interviews, the story does not present the whole picture.

I would not argue that applying narrative techniques is a “magic trick” that necessarily will improve today’s science journalism. However, I believe that using a range of journalistic genres can contribute to a broader picture of science and possibly position science coverage closer to reality than formulaic news depictions of what “new research shows” are capable of. Therefore, I would argue that we need science journalists who not only report new scientific findings, but also scientific processes, failures, or challenges. Moreover, if journalists *sometimes* get access to the humans behind the science, or in other ways portray science as an activity which affects peoples’ lives, this can make the reader experience science as more significant.

The unanswered questions

Subjectivity is everywhere. Our opinions and thoughts are framed by our genes, our background, and the environment we live in. However, subjectivity is not always obvious to us.

In narratives, the reader meets real people, whether they are scientists, hairdressers, retirees, or writers. Such stories let the reader see the world through someone else’s eyes, and it can give her a closeness to the material that she often does not get from reading news stories following the model of the inverted pyramid. Narratives enable identification, empathy, and trust, but also the opposite. The reader represents a third subjectivity in this puzzle, and the writer must recognize that she is by far the most mysterious one.

In the last passage of the earthquake story, Giulio Selvaggi and his wife are back in Bodø, Norway. At this point, the reader has been brought to Italy during the days around the earthquake in 2009 and the following years. Now, Selvaggi stands by the sea, fishing:

Most of Norway is unknown to Giulio Selvaggi, but not Bodø. He feels so good here. It is like finding the perfect pair of shoes.

As he stands by the shore with his fishing rod, with his wife of 19 years next to him, they feel the weather changing. The air from the land brings the coldness from the glaciers, the air from the sea brings the salt, the mild weather, the rain. In two minutes everything can change.

What will it be like to be here in the autumn or in the winter, when it is cold and dark? How will it be for the kids, will they find friends here? “No matter what, it is better than being in Italy now,” Ingrid Hunstad says. If it were up to her, they would move tomorrow. But Giulio Selvaggi wants to wait. He’s fighting a battle in Italy, a battle for his freedom. What happened is not fair. He did a good job, and was convicted for it.

But it is nice to be able to breathe, not having to check the news first thing in the morning. It is nice just looking for porpoises in the sea or wondering which fish will bite. Up here, 67 degrees north, Giulio Selvaggi feels a part of wild nature. Nothing more, nothing less. Here he is free. (Pileberg, 2014a, *my translation*)

The story ends with an open question. What will happen to Selvaggi is still unknown. Time would show that he was acquitted in November 2014, along with all the accused scientists. One of the public officials got a milder verdict.

A question that will never have an answer is which effect this story had on the people who read it. Did it make them hope for him to be acquitted? I do not know. Did it change their view of science? I do not know. Perhaps some of the readers did not like the story’s subjective style, and therefore did not get so involved. Finding an answer to these questions would require a study of its own, and although a reception study was my initial idea when I started working on the master thesis, I soon realized that this was beyond my capacity. Still, I hope that most readers got something out of reading it. I also hope that it contributed to an understanding of the fact that science cannot give us answers to all our questions – even when we need them the most.

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APPENDIX

The Earthquake that Shook the World

(My translation from Norwegian)

An Italian court convicted seismologist Giulio Selvaggi for manslaughter, but Selvaggi believes that he simply did his duty. October 10, 2014 marks the beginning of a trial that has shaken researchers around the world.

By Silje Pileberg

Flying into Bodø, Giulio Selvaggi enjoys looking out of the window. He looks down at the u-shaped valleys, formed by glaciers, and at the v-shaped valleys, formed by rivers. He looks at the fascinating white beaches, so far north.

Still, even a man of nature needs a roof over his head. Therefore, on an August day in 2013, he is standing at the top of a ladder, propped against an old wooden house outside Bodø. He holds a paintbrush in his hand. He wants the yellow color to be just as it was before; he will do a thorough job. His parents raised him to be a responsible person.

This summer day the whole family is painting and gardening: two children, a Norwegian mother, and an Italian father. They spend every summer at this place, but everything has changed now. The yellow wooden house is no longer a holiday house. It can become their new home.

One day they hope to pack their belongings in Italy and travel north for good: two children, a mother, and a father convicted for the manslaughter of 29 people.

Italy, 31 March 2009

A car from the institute INGV is on its way from Rome towards the mountain city of L'Aquila. In the car sit three of the world's foremost earthquake experts. Two are members of Commissione Grandi Rischi, a committee that gives Italian authorities advice about risk situations. The third person is Giulio Selvaggi, director at the INGV, the Italian Institute of Geophysics and Vulcanology.

L'Aquila is a beautiful medieval city in the Apennines. The baristas serve their espresso like in all other Italian cities, clothes are dried outside the windows, and students create a lively atmosphere in the streets.

However, for the last several months the citizens have been worried. A sequence of small earthquakes have shaken the city, and there are rumours of a big earthquake being expected. A retired lab technician has placed homemade radon measurement equipment around the region, and now he is predicting a large earthquake. The problem is only that such measurements haven't proved credible in scientific studies. Throughout decades of research, scientists have not succeeded in perfecting a single method to predict tomorrow's big quake.

Still, many people now hope that the experts can tell them what to do, whether to leave their homes or stay calm. Many have great expectations for the meeting which is initiated by the state civil protection office, Protezione Civile.

When Giulio Selvaggi enters the meeting room together with his colleagues, the room is full of people. Such interest! There are local authorities, people from Protezione Civile, and several journalists. The journalists must leave the room before the meeting starts.

Selvaggi looks forward to performing his duty. He will inform the people in power about all the small earthquakes that have been experienced in the area; he will explain that it *has happened* that a sequence of earthquakes has preceded a big quake, but that most such sequences finish without a big quake in the end.

He will say what he knows – about the past. He will not make evaluations for the future. That is not his duty.

At this point in time Selvaggi has no idea of all that will come. Nor has he any idea about the television interview that was made outside the meeting room a few minutes earlier, where the vice director of Protezione Civile, with a grandfatherlike calmness, asked the inhabitants to calm down.

He has no idea that 31 March 2009 will be a fateful day for Italy. No one can know such a thing, until the day arrives.

The meeting proceeds as such meetings often do. Data are presented, reports are passed around. Daniela Stati, the head of Protezione Civile's regional office, asks whether she should believe those who are spreading fear. The leader of Commissione Grandi Rischi, Franco Barberi, assures her that their claims have no scientific basis:

"The seismic sequences do not tell us anything about what will happen, but they certainly direct our attention to an area where, sooner or later, a large earthquake will hit," he says.

Another member of the commission, Enzo Boschi, concludes that a large earthquake is less likely in the near future, but that one can never know. He talks with aggression and determination:

"In Italy this is the zone which is most exposed to the risk of earthquakes, one of the zones. It can happen tonight, tomorrow, in one year, in twenty years!"

After the meeting Daniela Stati thanks the participants. She says that they have made it possible for her to calm the citizens.

The mayor of L'Aquila interprets things in another way: he decides to close some of the schools in the area.

L'Aquila, night of 6 April 2009

Surgeon and father Vincenzo Vittorini wakes up because he has fallen to the floor. "Why am I lying here?" he asks himself and gets on his feet. Standing there, he turns towards his wife Claudia and his daughter Fabrizia – they all slept in the same bed that night – and says that they can be calm, it is probably over now.

They do not respond. It looks like they are still asleep.

In the small town of Albano Laziale, 130 kilometers southwest of L'Aquila, the seismologist couple Giulio Selvaggi and Ingrid Hunstad wake up because their bed has moved. Selvaggi's first thought is that the frequency is low. The quake comes from somewhere far away.

Immediately he calls the surveillance room at work, finds out where, how strong, and sends a prayer: “Thank you, God, it was not 7.” An earthquake of magnitude 7 can cause enormous damage, but this is 5.9 on the Richter scale, several thousand times weaker (the earthquake would later be measured at 6.2). Still, he knows that the earthquake has hit the populated city of L’Aquila.

Giulio Selvaggi does everything right this morning. He turns his feelings off. Wearing his pyjamas he calls the head of Protezione Civile and informs him about the strength and the place. Then he pulls his trousers on, runs down to the car and arrives at work half an hour later.

When an earthquake with a magnitude of 6.2 hits a concrete building with significant construction errors, there is little one man can do. The walls move. The roof moves. The floor moves. The movements are extremely fast and they go in all directions; up and down and to the sides.

Around Vincenzo Vittorini there is a darkness that he has never seen before. And the house is dancing. The walls, the floor, the furniture – they are all dancing. He feels as if he is inside a blender.

And then there is the sound. The terrible sound! It is not like a “booo-aaaaaah” like he has been told. It is more like a scream. It is a scream so high, that when Vincenzo Vittorini screams with all his might, he can’t hear a thing.

Five days after the visit of the earthquake experts, 309 people die in L’Aquila. The survival of Vincenzo Vittorini is an absurd miracle. For six hours, he is buried under concrete and furniture, crouched next to his and Claudia’s double bed. He listens to the gradually weaker sounds from his wife and daughter; he tries to speak to them, but his voice cannot reach them.

L’Aquila, 24 September 2012

A tall, blond woman sits in a courtroom. The accused is her husband, Giulio Selvaggi. On her first time in a courtroom, May 30th, she watched him take the witness stand. She was so nervous for him that she could not write. Today she will. Their daughter, Liv, has lent her a notebook. For Ingrid Hunstad writing is a way to escape from her thoughts.

It feels so embarrassing to be there. They, of all people. They, who through all their adult lives have been working for the good cause; for a greater understanding of how earthquakes hit.

Today they should have been on the other side, together with the victims. How wrong it feels that the victims sit there scowling at her; that they see her as the wife of a killer.

Fabio Picuti, the prosecutor, is talking, loudly and slowly, so as to underline every single word. Dressed in a long black robe, he blames the accused for having kept scientific findings secret at the meeting in L'Aquila.

Why didn't anyone mention the study from 1995, which claimed a 100 percent probability of a big earthquake during the next 20 years? Why didn't anyone mention the book saying that a sequence of small earthquakes often precedes a big one?

"Here you see the flimsy, negligent, and inappropriate behaviour of Commissione Grandi Rischi," Picuti states.

Hunstad takes notes, but she can barely believe what she is hearing. "It is absurd," she says to herself. It seems like the prosecutor is cherry picking research material, presenting it as the one and only truth, and not as what it really is; namely pieces of transitory knowledge - later it would be turned down.

Inside the courtroom it is 30 degrees celsius, and no ventilation. After four hours Hunstad feels like she might faint any moment. She leaves the room and strolls over to the small wooden house next door, where three women run a coffee bar. They smile at her as she enters through the door. Hunstad feels relieved.

Vincenzo Vittorini is a middle aged man with determined, brown eyes. He is not happy anymore.

He regrets that Claudia and he made the decisions they made; he regrets having bought the apartment in the first place. It was a nice apartment on the third floor, with a wonderful balcony and a view of the green valley. They used to sit there during long summer evenings. However, he could have been perfectly happy without those evenings, if he had not lost his wife and daughter.

If only they had chosen differently. If only they had decided to do as his father would have done. When small earthquakes shook Vincenzo's birth home, his father always brought his family outside to sleep in a piazza.

If only they had not listened to the experts.

The experts had told them it was safe! Just before the meeting on March 30th, the vice director of Protezione Civile, with a grandfatherlike calmness, told the local TV station that people could calm down:

“The scientific society continues to assure me that it is a favourable situation. The small earthquakes release the energy (...).”

Therefore, when a pretty strong earthquake hit at 11 pm, 5 April 2009, and then a smaller one at 12.40 a.m., Vittorini and his wife told each other that what had been said seemed right; the more energy released, the better it is.

What really happened in L’Aquila? No matter how many people you talk to, no matter how many papers you read, the question never seems to have a satisfying answer.

What we do know is that relatives of 29 victims went to court. They claimed that if their loved ones had not been calmed down by authorities and experts, they would have left the homes that would later fall down on them.

Giulio Selvaggi, the five other scientists at the meeting and the vice director of Protezione Civile were accused of having given “incomplete, imprecise and contradictory information” prior to the big earthquake.

The trial received worldwide reactions. The world’s largest scientific association, the American Association for the Advancement of Science, sent an open letter to the Italian president and asked him to intervene. They called the accusation “unfair and naive”. The journal *Nature* called the verdict “perverse and ridiculous”, and encouraged people to protest.

Prosecutor Fabio Picuti had to defend himself.

“I am not crazy,” he told *Nature*.

“I know they can’t predict earthquakes. The basis of the charge is not that they didn’t predict the earthquake. As functionaries of the state, they had certain duties imposed by law: to evaluate and characterize the risks that were present in L’Aquila.”

According to Picuti, the risk assessment should have included the density of the urban population and the known fragility of many ancient buildings in the city center. Picuti claimed that the experts were more interested in calming down citizens than telling them how to prepare for an earthquake.

On the other side researchers claimed their innocence. They did not know what the vice director had told the local TV station before the meeting. Nor had they been invited to the press conference. They had come for the meeting, then left.

“I never reassured anyone,” Giulio Selvaggi says.

The minutes of the meeting support him. The e-mails he sent to worried citizens who contacted him before the meeting, also support him.

Massimo Mazzotti, Director of the University of California Berkely, wrote in a commentary that one of the scientists' mistakes, was that they did not correct what the politicians said to the media. The comforting messages that reached the inhabitants of L'Aquila in the days prior to the earthquake may have led them to make fatal choices.

Giulio Selvaggi experienced the trial as if he were outside himself, as if motion pictures were floating by him. He was convinced of his innocence and thought all along that he would be proven not guilty. That was what everyone around told him as well, all the colleagues, all the top lawyers, everyone, except one.

Ingrid Hunstad did her own thinking, and warned him, again and again: "The lawyers are taking this too lightly. They do not understand how serious it is."

L'Aquila, 22 October 2012

It is a perfect day to be declared innocent. Outside the courtroom the sun is shining on the blue mountains. Winter is approaching, but it is almost 30 degrees.

The courtroom is too small for the attention this trial has received. People are pushing their way in between the chairs. Photographers are standing along one wall. The cameras are from Japan, Germany, Great Britain ... Italian Rai Uno is broadcasting directly. Giulio Selvaggi thinks about his mother who is sitting at home watching. He still believes that he will be declared innocent, but deep inside him a notion of injustice tingles.

In the back of the room are the relatives of the deceased. Among them is Vincenzo Vittorini. He wants justice.

The judge enters the room wearing a black robe. He looks straight ahead, then he bends his head towards the decree. The verdict is the same for all of the accused.

After a few minutes Selvaggi turns towards the woman who has been his wife for 18 years. He understood before she did: from now on, everything will change.

Giulio Selvaggi, Claudio Eva, Enzo Boschi, Gianmichele Calvi, Franco Barberi, Mauro Dolce, and Bernando De Bernadinis – five scientists and two public officials – all got the same sentence this October day in 2012: six years

in prison, legal interdiction meaning the loss of many rights during these six years, claims of EUR 7.8 million in total, and the loss of the right to receive salaries from the Italian state.

The verdict may be the first where scientists are convicted after a natural disaster. According to Norwegian Professor of Sociology Law, Kristian Andenæs, it may not be the last.

“It has become more and more common to call for punishment and other strong reactions,” he says.

If a public official made a mistake a few years ago, one was usually satisfied with expressing disapproval or – if more serious – financial claims. Today, more and more people and institutions are prosecuted if they make a mistake. Andenæs believes the reason is that victims get more attention, along with the idea that victims are better off if the responsible person is punished.

Andenæs still believes that the L’Aquila case is special. In this case, it is not clear whether the convicted have done anything wrong at all.

“This case revolves around people not being able to predict the future. This is a task involving a high degree of uncertainty.”

The case also revolves around communicating uncertainty to people who lack expert knowledge. On 31 March 2009, the inhabitants of L’Aquila were scared and nervous. Should the scientists have put more effort into communicating?

“If there is reason to believe that something can go wrong, those who know that have a responsibility to say so. It is hard to tell whether the experts should have been more active in this case,” Andenæs says.

He adds:

“Today, it is easy to say that they should have made an effort to enhance the information that reached the citizens of L’Aquila. But at that point, it may not have been as clear.”

Albano Laziale, December 2012

Giulio Selvaggi and Ingrid Hunstad offer a pair of slippers in their villa in the hills outside Rome. Selvaggi lights the fireplace, and they serve tea in a ceramic teapot from Norway.

Outside, the green garden is dressed for winter. The kiwi tree stands there with no fruit, and the caravan is parked in its usual spot. It has been driven thousands of miles. Every summer, it is driven from Albano Laziale in the south to Bodø in the north, with Hunstad’s parents behind the wheel. And a

few weeks later, it returns from Bodø up north to Albano Laziale down south. Then, Hunstad and Selvaggi are driving.

The afternoon sun is reflected on the Mediterranean several kilometers from their window, and the couple talk about the last few months, and years. Their lives changed during these years. In the beginning, they were a family like all others; then they turned into a family with a father convicted of manslaughter.

They talk about the two men in the fish store who start whispering when Selvaggi enters, about all the looks – at the supermarket, in the bank. They talk about guilt, about innocence, justice and injustice. They talk about the shock after the sentence, about depression, and about how time works, “in a perfect way”, to make people deal with what they never imagined they would have to experience.

They also talk about all the help they have received, mainly from abroad, including Norway. In Norway they have colleagues, relatives and friends. They relax there. Among the fjords and mountains at Hunstad, close to Bodø, they find the peace that has been so hard to find in Italy.

Bodø, August 2013

Most of Norway is unknown to Giulio Selvaggi, but not Bodø. He feels so good here. It is like finding the perfect pair of shoes.

As he stands by the shore with his fishing rod, with his wife of 19 years next to him, they feel the weather changing. The air from the land brings the coldness from the glaciers, the air from the sea brings the salt, the mild weather, the rain. In two minutes everything can change.

What will it be like to be here in the autumn or in the winter, when it is cold and dark? How will it be for the kids, will they find friends here?

“No matter what, it is better than being in Italy now,” Ingrid Hunstad says.

If it were up to her, they would move tomorrow. But Giulio Selvaggi wants to wait. He is fighting a battle in Italy, a battle for his freedom. What happened is not fair. He did a good job, and was convicted for it.

But it is nice to be able to breathe, not having to check the news first thing in the morning. It is nice just looking for porpoises in the sea or wondering which fish will bite. Up here, 67 degrees north, Giulio Selvaggi feels part of wild nature. Nothing more, nothing less. Here he is free.

ABOUT THE STORY

This story is based on communication with Giulio Selvaggi, Ingrid Hunstad, and Vincenzo Vittorini in 2012, 2013, and 2014, on observations in L'Aquila and Albano Laziale in December 2012 and on conversations with inhabitants. Other sources are photographer Tina Alnes Jørgensen, lawyer Marcello Melandri, seismologist Gaetano De Luca living in L'Aquila, seismologist Alessandro Amato at the INGV, professor Kuvvet Atakan at the Institute for Geoscience, University of Bergen, the Association L'Aquila Che Vogliamo, a long list of newspapers and magazines, the minutes of the meeting from 31 March 2009, Ingrid Hunstad's diary, and photo/video material accessible on the Internet.

FACTS

The L'Aquila verdict

309 people died because of the earthquake in L'Aquila, Italy, 6 April 2009. The earthquake had a magnitude of 6.2.

Relatives of 29 victims went to court, convinced that their loved ones had died because they had been calmed down by authorities and experts prior to the earthquake. Without these reassuring messages, they would have left their homes.

In 2012, seven people were convicted for the manslaughter of 29 people. Five were among Italy's foremost seismologists and geologists, and four of these were members of Commissione Grandi Rischi. The last two accused were both from Protezione Civile (civil protection).

Commissione Grandi Rischi's duty was to advise authorities in risk situations. Protezione Civile was responsible for informing the citizens.

The seven were convicted of analyzing earthquake risk in a "superficial, approximate and generic" way, and it was implied that they had taken part in a media operation to calm down the citizens. The reasoning of the verdict was 950 pages long.

After the verdict the leader, second leader and forming leader of Commissione Grandi Rischi stepped down from their positions. The verdict made it impossible for them to perform their duties.

All received the same sentence: six years in jail, legal interdiction, financial claims of in total EUR 7.8 million, and loss of the right to receive salaries from the Italian state. No one admitted guilt.

The appeal started 10 October 2014.

After this story was published, the appeal court found six of the seven to be innocent. Bernardo de Bernadinis from Protezione Civile was given a milder sentence.