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Echoes of Cosmic Events and Global Politics in Moominvalley: Cosmic and Astronomical Sources of Incitement in Tove Jansson's *Comet in Moominland*[1]

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Abstract: Tove Jansson is known worldwide as the mother of the Moomins. She was a visual artist and writer. The first Moomin books deal with the threat of apocalypse. The 1946 book about the comet approaching the Earth is interesting because of the changes Jansson made in the later versions (1956 and 1968). The first edition is shown to reflect the fear of possible Soviet occupation of Finland after World War II. In the last, 1968 edition this was replaced by a fear of a global nuclear war. In her illustrations and texts, Jansson drew inspiration from several scientific sources, many of which are identified in the article. The case of a meteorite falling in Finland in 1899 is also discussed.

Keywords: *apocalypse, Moomins, science inspiring arts, scientific instruments, Tove Jansson*

Tove Jansson, the artist

Tove Jansson (1914–2001) is known worldwide as the mother of the Moomins. Outside her home country Finland it is less known that she was an exceptionally versatile artist. She was a painter, graphic artist and illustrator. She made cartoons, wrote novels, short stories, poems, plays and cabarets, children's books, etc. Her life and works have been studied from the points of view of history of literature

[1] The financial support granted by the Arts Promotion Centre Finland is gratefully acknowledged.

and history of art (see Holländer, 1983; Westin, 1988; Kruskopf, 1995; Rehal-Johansson, 2006; Westin, 2014; and Karjalainen, 2014).

Tove Jansson wrote the text of her comet book in summer 1945 and made the illustrations in May 1946 (Westin, 2014, pp. 176–185). The threat of the end of the world is strongly present in Jansson's first Moomin books, *Småtrollet och den stora översvämningen* ('The Moomins and the Great Flood'; Jansson, 1945) and *Kometjakten* ('Comet in Moominland'; Jansson, 1946). The feelings of destruction are an important factor also in later Moomin stories. It is interesting that Jansson rewrote the first Moomin books, so that the comet adventure came out in two other editions, *Mumintrollet på kometjakt* (Jansson, 1956) and *Kometen kommer* (Jansson, 1968). Rehal-Johansson (2006, pp. 88–99) has studied changes in different editions of the Moomin books. There are considerable differences between the first and the second edition of the original comet book. Many details have been omitted. Generally speaking, the text in the second edition is more condensed and less exotic, and the author's literary style has improved. Holländer (1983) studied the illustrations of the Moomin books and development of Jansson's illustration techniques and identified some sources of inspiration.

The early years in the surroundings of the Helsinki observatory

Tove Jansson spent her early years with the family at Katajanokka in Helsinki. The language of the family was Swedish. She went to a Swedish-speaking school that her father, sculptor Viktor Jansson (1886–1958) had also attended. The school was close to the observatory of the University of Helsinki. At present, the school building is the venue of Design Museum Finland. Tove Jansson broke off her school education in 1931 and left for Stockholm to study art at the *Tekniska skolan*, the same school as her mother Signe Hammarsten-Jansson (1882–1970), who mainly worked as illustrator. Singe Hammarsten-Jansson came from a Swedish family. In Stockholm Tove Jansson lived at the home of her uncle Einar Hammarsten, professor of chemistry and pharmacy at the medical university Karolinska Institutet. Tove Jansson returned to Helsinki in 1933 and studied art of painting at the school of the Finnish Art Society until 1936. Most students at the school considered the education that the school offered as outdated, which was why Tove Jansson started attending evening classes in painting and drawing

Figure 1. The oil painting *Mystiskt landskap* ('Mysterious landscape') was finished by Tove Jansson in the 1930s. The school of the future artist was close to the Observatory Hill in Helsinki and she frequently visited its surroundings during her formative years. Reflections of the Observatory Hill (Fig. 2) can be seen in the setting of the painting. Oil on plywood, 61x152.5 cm, photo by Hannu Aaltonen, courtesy of the Ateneum Art Museum, Finnish National Gallery.

at the Free Art School, founded in Helsinki in 1935 by Maire Gullichsen (1907–1990). Soon after returning to Helsinki, Tove Jansson started drawing cartoons commenting politics and everyday life, especially for the satiric monthly *Garm* (Karjalainen, 2014, pp. 1–37). Together with some of her student companions, she hired a studio on Tähtitorninkatu (Observatory Street) immediately south of the Helsinki observatory. When going to school and later on her daily visits to the studio she became acquainted with the large Observatory Park and the observatory on top of the Observatory Hill. Her painting *Mystiskt landskap* ('Mysterious landscape', Fig. 1) dating from the 1930s (Karjalainen, 2014, p. 23) could be seen as a reminiscence of her early years. In the painting, a straight park lane ascends towards a white building with a central tower on top. The view is very similar when looking towards the observatory at the southern end of the Unioninkatu (Union Street) in Helsinki (Fig. 2).

Tove Jansson did not look at the observatory from outside only. On 1 September 1944, a cartoon by Tove Jansson was published on page 5 of *Garm*. In the cartoon (Fig. 3), an astronomer is demonstrating his guest the heavenly wonders through the telescope. The sky is seen high above but it does not look at all like a clear night sky with stars but rather as if anti-aircraft shells were exploding all around. The picture was published just half a year after the extensive bombing of Helsinki in February 1944 by the Soviet air force in World War II. It was

Figure 2. A view of the southern end of Unioninkatu Street in Helsinki towards the University Observatory. Photo by Nils Wasastjerna in the 1910s, courtesy of the Helsinki City Museum.

the strategic decision of Iosif Stalin to try to break the backbone of the Finns by completely destroying the Finnish capital using heavy bombardments. The anti-aircraft defence of the Finns was efficient enough to make the effort in vain. Tove Jansson herself experienced the bombardments of Helsinki during World War II and certainly remembered well the fires above Helsinki (Lappi, 2005, pp. 712–735).

A professional astronomer may immediately recognize the telescope in the *Garm* cartoon. It is the double refractor of the Helsinki Observatory (Fig. 4) used for cataloguing stars within the programme called *Carte du ciel* ('Sky Map') since the 1890s (Lehti & Markkanen, 2010, pp. 167–184; Markkanen, 2015, pp. 168–169, Figs. 51 & 52). An astronomer also knows that there is never much light available in an observatory dome when the telescope is used for observations because the light would hamper the sensitivity of the human eye adapted for seeing faint objects in the dark sky. One must appreciate Tove Jansson's ability to observe and record even minuscule details of the telescope and the unusual environment during her visit to the Helsinki Observatory. It was generally

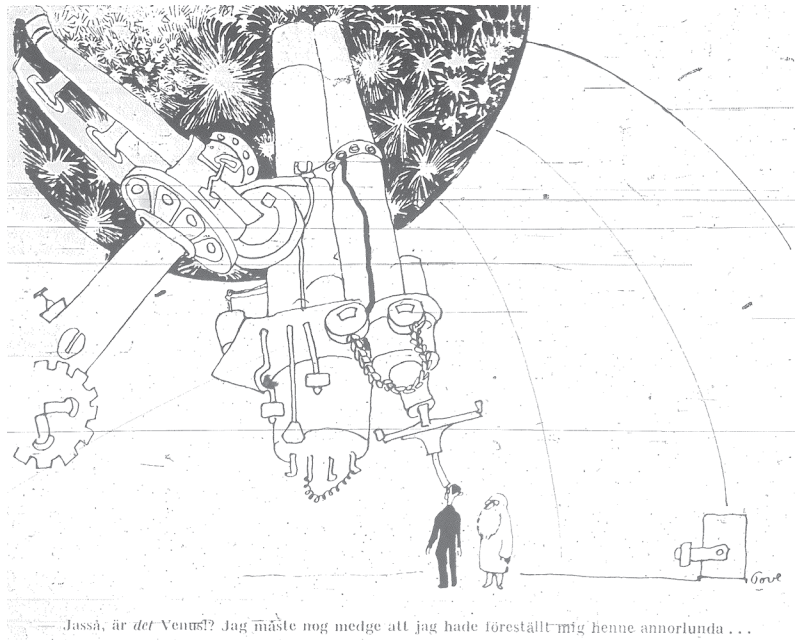

Figure 3. Tove Jansson made this cartoon for the journal *Garm*. An astronomer is showing planet Venus to his guest with the telescope. The guest comments: "Well, is that Venus!? I must admit I've imagined her a bit differently…" The view towards the sky reminds more of the explosions of anti-aircraft shells than stars. There is no doubt that the model for the telescope is the double refractor of the Helsinki Observatory. It was used for taking photographs of the sky. (Jansson, 1944, p. 5, National Library of Finland)

known among the colleagues and friends of Tove Jansson that she had eidetic memory, i.e. she could remember events and places to the smallest of details (Ulfsson, 2014; Pettersson, 2014).

Galileo Galilei made his first telescopic observations of the Moon in late 1609 (Galilei, 2004, pp. 14–32). Galileo's report of the lunar observations soon inspired artists, as can be seen in the painting *Immacolata* by Lodovico Cardi, called Cigoli, made for the Pauline Chapel (also known as the Borghese Chapel) of the Basilica di Santa Maria Maggiore in Rome already in 1610–1612 (Reeves, 1999, pp. 138–154, and Plate 6). Showing stars to a visitor also became a theme for art. Looking at celestial bodies with a telescope was also the theme of eight oil paintings by Donato Creti (1671–1749). The paintings were ordered in 1711 by Luigi Marsili and donated to Pope Clemens XI. They are at present in the

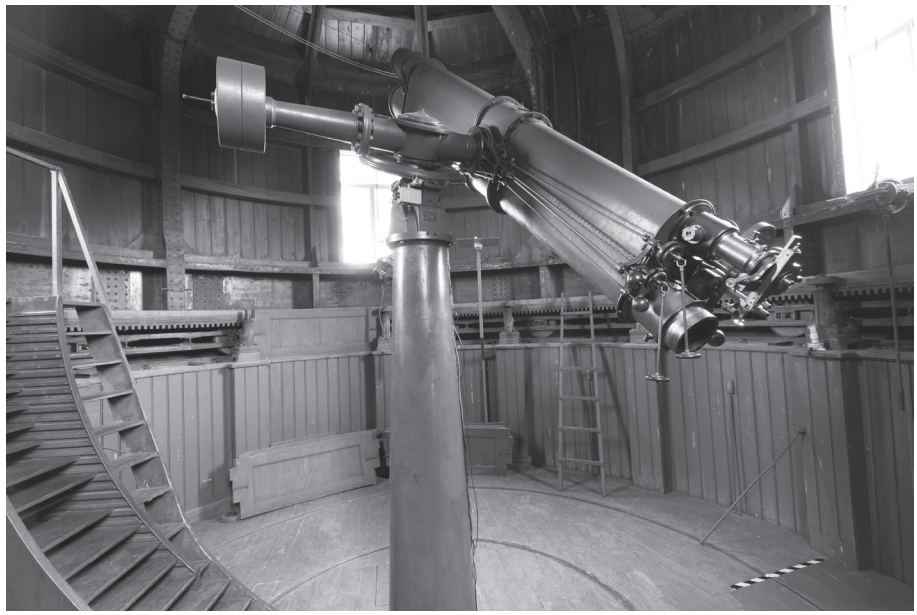

Figure 4. The photographic double refractor of the University of Helsinki Observatory. Tove Jansson must have seen it because in the cartoon in *Garm* she gave the telescope exactly the same appearance. Photo courtesy of Markku Sarimaa.

Pinacoteca Vaticana, sala XV (Roll, 1967, pp. 31–32, 96; Zimmer, 1980, p. 126; Sestri, 1990, p. 275).[2]

A later example is an oil painting *Der Astrologe* or *Der Sterngucker* ('Star Gazer') by German Carl Spitzweg (1808–1885) from the early 1860s (Fig. 5). The atmosphere in Spitzweg's work is full of gentle humor. Jansson's cartoon is sarcastic and has many levels. Despite the comical situation the presence of the war can be sensed.

How did Tove Jansson get to the Helsinki Observatory? It was never open to the public for looking at stars. Even during World War II the telescope was used for observations on every clear night according to a scientific programme (Järnefelt, 1943). The instrument was dismantled in February 1944 after heavy Soviet bomb rides and was remounted after the war (Lehti & Markkanen, 2010, p. 216). Jansson's cartoon was published in *Garm* in September 1944. She must have seen

[2] The set of the eight paintings at the Vatican Museum are available online, for instance, at http://www.astroarte.it/astroarte/artivisive/storia/creti.htm

the telescope before winter 1943–1944.

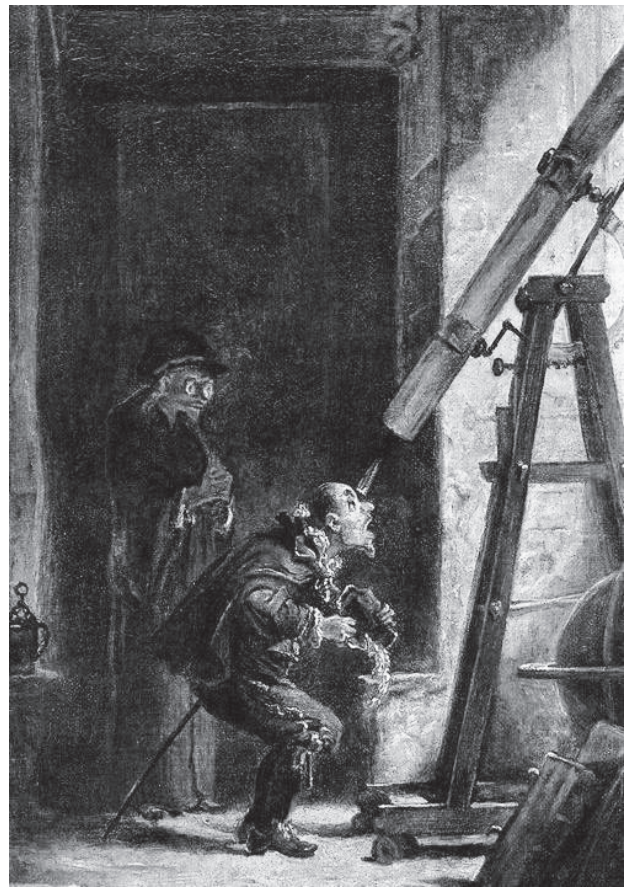

Figure 5. Carl Spitzweg painted this oil painting in the early 1860s. An exited owner of a telescope is showing an accidental gazer the Moon. The visitor is trying to see what he is told. The original at Museum Georg Schäfer, Schweinfurt, Germany. Photographed by the author from a postcard of unknown origin.

Oscar Furuhjelm (1880–1963), a graphic artist and publisher at the Tilgmann publishing house in Helsinki, was very important for the professional career of Tove Jansson. He commissioned from her illustrations and encouraged her professionally since 1928 (Westin, 2014, pp. 68–71). Oscar Furuhjelm studied graphic art in Germany and brought to Finland stylistic influences from the famous satirical journal *Simplicissimus* (Reitala, 2004). Since 1906, the astro-photographic programme at the Helsinki Observatory was led by Ragnar Furuhjelm (1879–1944), professor of astronomy, politician, member of the parliament and minister. He died in a traffic accident in 1944 (Lehti & Markkanen, 2010, pp. 184–195). Oscar and Hjalmar Furuhjelm were fourth cousins and of the same age. Both were members of the Swedish-speaking intellectual community in Helsinki which Tove Jansson was also about to enter. Oscar Furuhjelm and Tove Jansson's mother Signe Hammarsten-Jansson were colleagues. During several decades he commissioned illustrations from her, for example, for book covers.

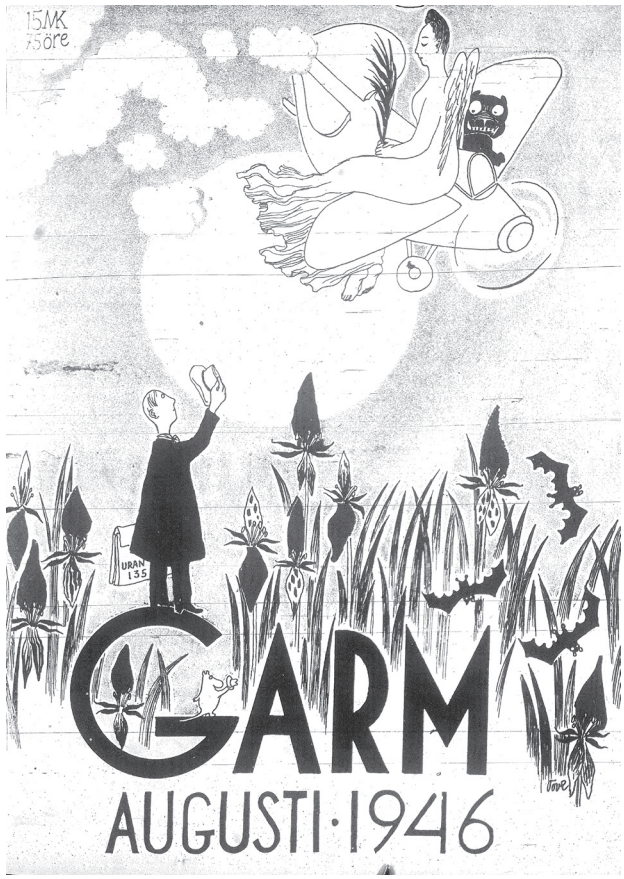

Figure 6. The cover of *Garm* of August 1946 by Tove Jansson. An angel of peace passes a man on the ground surrounded by bats and flowers. The text 'Uran 135' on his briefcase refers to the atomic bomb. (National Library of Finland)

In summer 1933, the Jansson family moved from Katajanokka to Lallukka artists' home in another part of Helsinki (Westin, 2007, p. 55). In 1942, Tove Jansson hired a studio not far from Lallukka in Töölö district. In late summer 1944, she bought the studio and home of her former art teacher Hjalmar Hagelstam (1899–1941). The Free Art School operated in his home in the late 1930s and Tove Jansson knew well the place in a tower on top of a house not far from the Observatory Hill. In 1941, Hjalmar Hagelstam got killed in action in the war against the Soviet Union. The war took its ruthless toll among Tove Jansson's closest friends and colleagues. The oppressive times of war, depression and fear found their expression in Jansson's art, letters to friends, and in her diaries (Karjalainen, 2014, pp. 70–77; Kruskopf, 1995, pp. 7–9, 18–19, 44, 46–47, 52, 60, 72, 90, 100, 117). The cartoons in *Garm* also show the new reality and problems of times immediately after World War II. On the cover of *Garm* from August 1946 (Fig. 6) one reads 'Uran 135' (Karjalainen, 2014, p. 113). The number was supposed to read 235, referring to Uranium-235, the isotope used in making fission (atomic) bombs.

Threat of a disaster from the sky: the comet's time changed

It was mentioned above that Tove Jansson made changes in the text of her book about the comet (Jansson, 1946, 1956 & 1968). In the following, one of the changes will be discussed. In the first edition of 1946, the archetype of a pessimist, a muskrat who reads Schopenhauer and Oswald Spengler's *The Decline of the West* (German original *Untergang des Abendlandes*, 1918–1922) tells the Moomins about the comet approaching. He does not know if it is going to hit the Earth or is it just passing. He tells that they would learn more at the Observatory on the Lonely Mountains (Jansson, 1946, p. 36). Sniff and Moomintroll leave for the observatory. On their way they meet with the Snufkin who joins them and leads them to the observatory. In the third, 1968 edition it is the muskrat who tells Sniff and Moomintroll about the observatory but about the comet they only learn from Snufkin (Jansson, 1968, p. 34). When approaching their destination, Snufkin tells his companions that they are almost there because on the path leading up to the observatory they find a lot of cigarette butts thrown down by the astronomers (Jansson, 1946, p. 74; 1956, p. 65; 1968, p. 55).

In the two earlier versions of the comet story (Jansson, 1946, p. 83 & 1956, p. 75, respectively) Sniff, Moomintroll and Snufkin learn from the astronomer that the comet will collide with the Earth on the 7th of October. In the third edition, the date has been changed: the comet will hit the Earth on the 7th of August. Rehal-Johansson (2006, p. 174, note 388) took note on the change of dates but offered no explanation. Earlier research has generally referred to the threat of destruction or the apocalypse (Westin, 2014, pp. 176–185), and the threat of a nuclear war (Karjalainen, 2014, p. 134; Westin, 1988, pp. 135–161, especially p. 139; 2014, pp. 185–191). It is evident, however, that the date of the predicted collision was changed for some reason between the second (1956) and third (1968) version of the book. The following explanation is suggested here.

When Tove Jansson wrote the first (1946) edition there was real fear and possibility of a Soviet occupation of Finland. The war between Finland and the Soviet Union ended when the armistice was signed in Moscow on 19 September 1944 (Jussila *et al.*, 1999, pp. 207–217). According to the treaty, the allied forces (the Soviet Union, the United Kingdom and the United States of America) placed an Allied Control Commission to see that Finland would fulfil all the conditions of the treaty (Jussila *et al.*, 1999, pp. 225–230). The Finnish signals intelligence was aware that the Soviet Union had no intention to occupy Finland and end its

independence (Jussila *et al.*, 1999, p. 244). Since autumn 1944, however, there were strong rumors and fear among the public that the chance of Sovietization of Finland was real. Andrei Zhdanov chaired the control commission (Jussila *et al.*, 1999, p. 224). He could hardly have had worse reputation in Finland. He was a central actor during the Stalin purge in the Soviet Union. Zhdanov was sent to Estonia to take care of its annexation to the Soviet Union in June 1940 (Jussila *et al.*, 1999, p. 225). On 5 October 1994, Andrei Zhdanov arrived in Helsinki to start his work. The next day, it was reported in most newspapers of Finland (e.g., *Helsingin Sanomat*, 1944, p. 5). In international politics the term "iron curtain" was again adopted by Winston Churchill (1962, pp. 489 & 514).

World War II ended with the Paris Peace Treaty on 10 February 1947. The Allied Control Commission left Finland on 26 September 1947. As told above, the date of collision of the comet in the third and final (1968) version of the book is 7 August instead of 7 October. What could be the reason of that change? The United States used an atomic bomb against Japan, on 6 August 1945 in Hiroshima and three days later in Nagasaki. When the last edition of Jansson's book was published in 1968, the threat of the Soviet occupation of Finland was no longer relevant. But now there was a fear of global nuclear war in its place. Cold war was a prevailing presence and the arms race was at its peak. The threat of World War III was looming over every crisis in international politics, as in Berlin in 1961 and Cuba in 1962. The development of increasingly bigger nuclear bombs culminated when the Soviet Union exploded the biggest hydrogen bomb so far in Novaya Zemlya in October 1961 (Gaddis, 2005, *passim*).

In the first (1946) version of the comet book, there are several omens of the hostile comet in the form of a star with a tail. Sniff has placed mussel shells on the floor of a cave. When he and Moomintroll return to the cave, someone has moved the shells into a shape of a star with a tail (Jansson, 1946, p. 32; 1956, p. 30). The grey sea is calm and seagulls are resting on it. The birds are facing the open sea and they are sitting in a shape of a star with a tail (Jansson, 1946, p. 33; 1956, p. 31). After returning home, Moomintroll notes that someone has placed the pears preserved by Moominmamma into a shape of a star with a tail (Jansson, 1946, p. 35). In the second (1956) edition, the event is told slightly differently (Jansson, 1956, p. 33). In the last (1968) version, Sniff and Moomintroll do not revisit the cave before they leave for the observatory. Neither are the stars with a tail mentioned as omens. It is suggested here that the stars with a tail of the earlier (1946 and 1956) versions refer to the red stars on top of the towers of the Moscow Kremlin glowing in the night. A red star particularly refers to the red Soviet army.

In the 1968 version of the comet book, the inhabitants of the Moominvalley fight the danger by using Snufkin's "subterranean sun tan oil" to impregnate the door blanket of the cave (Jansson, 1968, pp. 139 & 147). In the first (1946) edition, Snufkin says that even seventeen comets could not set the blanket prepared with his tan oil, on fire (Jansson, 1946, p. 167). In the second (1956) version the prepared blanket will survive any heat (Jansson, 1956, p. 145). It seems that in the earliest version there is a question of fighting the colliding comet. In the last, 1968, version we hear the echo of the cold war period of the late 1960s. There the challenge is to find a shelter against lethal radiation caused by a nuclear explosion.

In his interview, Tove Jansson's brother Per Olov Jansson told the author of this article that towards the end of the 1940s, the general fear of a Soviet occupation was prevalent also in the family. Over the years it changed to a fear of a nuclear war. "Tove never spoke about the war or her political attitudes at home. She expressed them in her pictures and writings but she did not speak. The change of timing of the collision well reflects the change of fears." (Jansson, P. O., 2015)

From where did the observatory on the Lonely Mountains come?

The visual layout of different (1946, 1956 and 1968) editions of the comet book varies only a little. In the first, 1946 edition the full-page pictures are in black and white watercolour. They were redrawn by Tove Jansson in Indian ink for the two later, 1956 and 1968, editions. In general, the composition of the large images is retained (Holländer, 1983, p. 14). Söderling (2007, p. 79) is wrong in claiming that Jansson redraw all the pictures in the comet book in the late 1960s. She renewed the large images for the 1956 edition and made some changes, such as shaping the noses of the Moomins to be more rounded (Jansson, 1946, p. 82; 1956, p. 73). She kept most of the smaller images and characters as they were. One can get an idea of the nature of the changes by comparing the two versions of the same scene in which Moomintroll, Sniff and Snufkin are about to enter the observatory on the Lonely Mountains (Jansson, 1946, p. 79; 1956, p. 70).

It was told above that Tove Jansson knew well the Helsinki Observatory and the park around it (Lehti & Markkanen, 2010, pp. 108–115) since her youth. The observatory on the Lonely Mountains is quite different in shape, however.

Figure 7. Sniff, Moomintroll and Snufkin about to enter the observatory on the Lonely Mountains (Jansson, 1946, p. 79, National Library of Finland).

It is placed on a high mountain and one must walk a long and difficult way to get there. It is evident that Tove Jansson carefully followed the development of observational technology in astronomy. Since the late 19th century, observatories with the biggest telescopes were built on mountaintops, as far as possible from city lights and smoke, in a climate with as many clear nights as possible (Hoskin, 1997, pp. 344–351). For instance, the visual shape of the observatory on the Lonely Mountains (Fig. 7) was not modeled after Mount Wilson Observatory near Pasadena in California (built 1907) but after the observatory of Ursa Astronomical Association in Kaivopuisto Park in southern Helsinki (Fig. 8). It was built in 1926 according to the plans of architect Martti Välikangas for the purpose of introducing the universe to the general public, and for observations of members of Ursa.

In the first two editions of the comet book it is told how the telescope is turning back and forth looking for dangerous objects in the sky through a glass dome (Jansson, 1946, p. 80; 1956, p. 71). In the third edition this is told slightly differently. The observatory tower has a round ceiling made from glass. It has a slowly rotating glass sphere with the colours of a rainbow (Jansson, 1968, p. 61). Observatories do not have glass roofs, but on top of the Ursa observatory in Helsinki there is a metal globe decoration. In an interview, Per Olov Jansson, Tove Jansson's brother, told the present author that his sister frequently wandered around on the rocks of the Kaivopuisto Park. It is quite possible that she also visited the Ursa observatory to have a look at the stars (Jansson, P. O, 2015).

Figure 8. It is quite evident that the Ursa public observatory in the Kaivopuisto Park in southern Helsinki served as a model for the observatory on the Lonely Mountains. The Ursa observatory was built in 1926 according to the plans of architect Martti Välikangas. In front of the observatory, there is the sculpture *Helios* by Lauri Anttila (2010). Photo by Otto Laosmaa, courtesy of the journal *Tähdet ja avaruus*.

The Moomintroll cites the Muskrat to Sniff: "The telescope of the observatory on the Lonely Mountains is the biggest in the world" (Jansson, 1946, p. 37). The interior of the observatory is really impressive (Jansson, 1946, p. 82; 1956, p. 73; 1968, p. 64). The sky visible through the opening of the observatory dome is very similar to the night sky in Tove Jansson's 1944 cartoon (*Garm*, 1 Sept 1944, p. 5) and again resembles explosions of anti-aircraft shells rather than stars.

The view of the interior of the observatory on the Lonely Mountains (Jansson, 1946, p. 82)—the walls and the dome ceiling—have much in common with the scene in the *Garm* cartoon (see Fig. 3). But the telescope is different. In the image of the comet book, the telescope looks like it is alive. It has got eyes. An astronomer immediately recognizes the telescope. It is the Lippert astrograph of the Hamburg Observatory in Germany. The Hamburg Observatory was founded in 1802. In 1906, it was moved to the Gojenberg Hill in Bergedorf, outside the city of Hamburg. A separate building was erected for each instrument (Ludendorff,

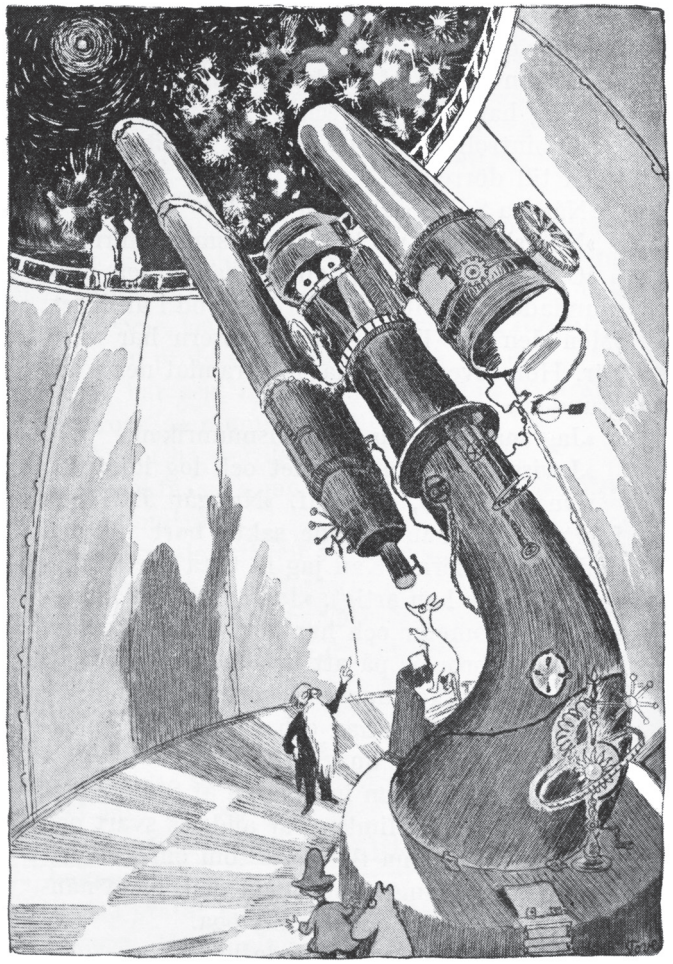

Figure 9. The adventurers of the comet book visit the observatory on the Lonely Mountains in order to find out about the comet colliding. Sniff is allowed to take a look at the approaching comet with the big telescope (Jansson, 1946, p. 82). Sniff wonders why there is no tail on the comet and why it does not move. The professor explains that the tail is just behind the comet. The object seems to be unmoving because it is rushing straight towards the Earth (Jansson, 1946, p. 83; 1956, p. 74). In the last edition, the astronomer tells the same thing in a slightly different wording (Jansson, 1968, p. 65). The explanation of the comet apparently not moving is correct. (National Library of Finland)

1922, pp. 169–171; Wolfschmidt, 2008; Hünsch, 2008).

In 1878, American astronomer Simon Newcomb wrote a book *Popular Astronomy* for the general public. The book became very popular and was published in German by Rudolf Engelmann (1881). Ilmari Bonsdorff (1913) adapted the book for the Finnish audience.

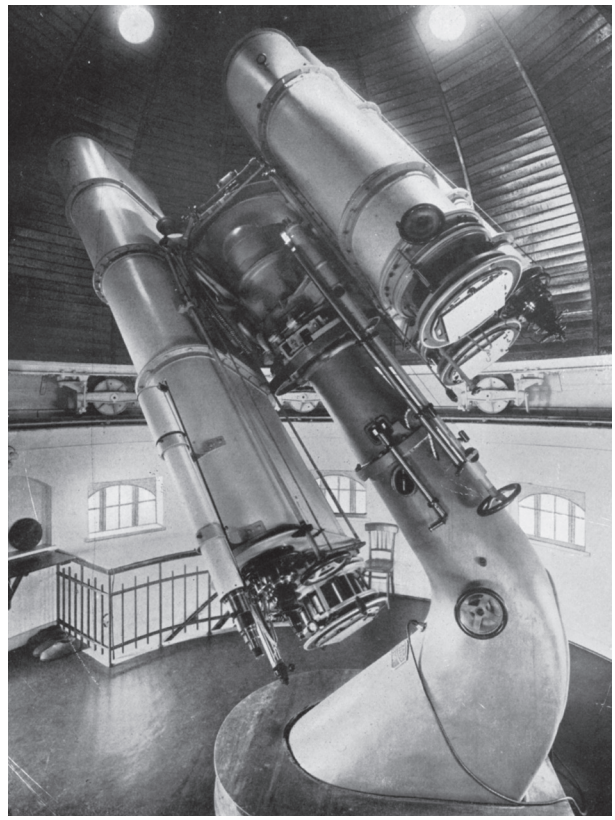

Figure 10. The Lippert astrograph of the Hamburg Observatory was pictured in the fifth edition of the Newcomb-Engelmanns *Populäre Astronomie* (Kempf, 1914, p. 168). The same picture was published in the Finnish edition of the book (Newcomb & Engelmann, 1929, p. 195; National Library of Finland)

In Germany, a series of extended editions of the book were published over and over until the late 1940s (Newcomb, Engelmann *et al.*, 1948). In the fifth (1914) edition of the book, the Hamburg Bergedorf Observatory was presented as an example of a modern observatory (Kempf, 1914, pp. 167–168). In 1911–1914, the Lippert astrograph was built in Bergedorf. It was a combination of several telescopes to be used for different kinds of observation of a single object. The instrument was donated by a Hamburg millionaire and amateur astronomer Eduard Lippert (Hünsch, 2012). The Moomintroll and Sniff want to have information on the comet and "see the stars with the biggest telescope in the world" (Jansson, 1946, p. 37). In the fifth edition of the Newcomb-Engelmann there is a picture (Table VII, Fig. 83; Kempf, 1914, p. 168) of the Lippert astrograph (Fig. 10). The telescope is in the same position as in Tove Jansson's comet book. Many other details match as well

Figure 11. 76 millimetre Bofors 27 BK anti-aircraft guns bought from Sweden were used under the command of Lieutenant-Colonel Pekka Jokipaltio (1901–1977) to defend Helsinki during the heavy bombardments in 1944. The gun was placed as a monument on Taivaskallio hill in Helsinki on the spot where one of the anti-aircraft batteries was placed during World War II. Photo by the author.

(Jansson, 1946, p. 82). V. A. Heiskanen adapted the Newcomb-Engelmann edition (1929) for Finland under the name *Tähtimaailma.* On page 195, there is Figure 107, a picture of the Lippert astrograph in the same position. The Newcomb-Engelmann edition was never published in Swedish. Several books on astronomy were published in Sweden for the general readership: Rendal and Söderborg (1922), Nordenmark (1929), Wallenquist (1938 and 1941). They do not have a picture of the Lippert instrument. The first picture of the Lippert astrograph in a Swedish book was published five years after Tove Jansson's (1946) comet book in the popular book by Åke Wallenquist (1951, p. 20). The book was translated into Finnish by Pentti Kalaja (Wallenquist, 1954, p. 22). In the Finnish adaptation of the Newcomb-Engelmann *Tähtimaailma*, there are 21 pictures of different telescopes. It is quite evident that the picture of the Lippert astrograph in the Finnish edition (1929) of Newcomb-Engelmann inspired Tove Jansson in creating the image for the comet book. It might be possible also that Tove Jansson was impressed by the picture of the Lippert telescope because it reminded her of the anti-aircraft guns

in Helsinki in times of war (Fig. 11) when she was creating the story of the comet.

An observatory as a spot for an adventure has inspired many strip cartoon artists. A good example is the Tintin story *L'Etoile mystérieuse* (Hergé, 1942) or *The Shooting Star*. In the Tintin adventure, the big telescope is obviously the great refractor of the Yerkes Observatory (see Fig. 5 in Hale, 1902, p. 298).

Ms. Sophia Jansson, MA, Tove Jansson's niece and artistic director of the Moomin Characters Oy Ltd. kindly let the present author see the catalogue of Tove Jansson's private library. There is no reference to the Newcomb-Engelmann book on astronomy nor to any other material on astronomy in that catalogue. But the Finnish edition of the book (Newcomb & Engelmann, 1929) was available in several public libraries in Finland. Since its publication in Finnish in 1929 it could be read at least in the Main Library of the City of Helsinki not far from Tove Jansson's home and studio since 1944. The author of this article read the book in the same place in the late 1940s.

In the early 1940s, when working on the comet book, Tove Jansson had close relations with Atos Wirtanen (1906–1979), a writer, journalist, leftist intellectual and politician. She even considered marrying him. (Karjalainen, 2014, pp. 77–78). It is possible that Wirtanen introduced Tove Jansson to Newcomb-Engelmann. She called him by a pet name 'Cosmosopher' (Karjalainen, 2014, p. 153; Laitinen, 2014). The connection could not be confirmed, however. Of Wirtanen's library only the Schopenhauer section has been preserved as one unit in the Library of the Labour Movement in Helsinki. No complete catalogue of Wirtanen's library was made after he died. In any case, it is obvious that the picture of the Lippert astrograph in the Newcomb-Engelmann book inspired Tove Jansson when she was working on her comet book.

The comet in Moominland cartoon series

Atos Wirtanen was the editor-in-chief of the left-wing Swedish language newspaper *Ny Tid* ('The New Times'). He encouraged Tove Jansson to make a cartoon series of the Moomins. The first Moomin cartoon series were published in 26 strips in *Ny Tid* from 2 October 1947 to 2 April 1948 under the title *Jorden går under* ('The end of the world,' Jansson, 2007). The plot is about a comet hitting the Earth. Moomintroll, Moominmamma and Moominpappa

Figure 12. In the ninth strip of the first Moomin cartoon series, Sniff, Moomintroll, Snufkin, Thingumy and Bob learn that the comet will collide with the Earth at 8:42 p.m. on Saturday, 7 October (Jansson, 2007, p. 23). The details match the story and illustrations of the comet book. (Jansson, 1946; National Library of Finland)

and Muskrat are figuring there. Moomintroll leaves for an expedition to find out about the danger. He is accompanied by Muddler, the father of Sniff, not Sniff himself as in all the editions of the comet book. They leave on a raft towards the W.S.W., or West-Southwest Observatory (Jansson, 2007, p. 12). This is confirmed in the fourth frame of the seventh strip in which "the journey went on towards west-southwest" (Jansson, 2007, p. 19). Tove Jansson gave the map of Moominland on the reverse of the title page of the third Moomin book *Trollkarlens hatt* ('Finn Family Moomintroll,' Jansson, 1949, p. 2). According to the map, the Lonely Mountains are situated outside the map but the direction is indicated. The signpost is pointing to the east. Apparently, Tove Jansson did not care too much for cardinal points.

The observatory on the Lonely Mountains appears already in the opening frame of the fourth strip (Jansson, 2007, p. 12). In some details, the cartoon series differ from the book. Two characters, Thingumy and Bob, are met on the journey. They do not figure in the comet book and appear first time in the third Moomin book *Trollkarlens hatt* (Jansson, 1948). The visit to the Observatory on the Lonely Mountains is mentioned in the ninth strip. The main lines of action follow the story of the book (Jansson, 2007, pp. 12, 23). In the tenth strip, the astronomer tells the visitors that the comet will hit earth on Saturday, October 7 at 8:42 p.m., "possibly, four seconds later" (Jansson, 2007, p. 24). In 1944, the 7th of October was in fact Saturday. The connection with the arrival in Helsinki of Zdhanov, chairman of the Allied Control Commission seems obvious also in the cartoon series. The astronomer of the observatory on the Lonely Mountains is seen at the telescope in the last frame of the ninth strip (Jansson, 2007,

p. 23). The person looks similar to the astronomer in the cartoon in *Garm* on 1 September 1944 (*Garm*, 1944, p. 5). Some similarity with Ragnar Furuhjelm and the astronomer's figure can be recognized, but hardly confirmed (Fig. 12).

In the cartoon series, the small expedition starts with returning home and comes across many adventures. Among others, Snorkmaiden is discovered (Jansson, 2007, p. 25). The end of the story differs from the book. The Moomins are saved in life rafts that look like unidentified flying objects. The cartoon series had to come to an end because Tove Jansson was about to have a journey to Italy. Some serious readers of the newspaper also did not like the series for its being too bourgeois with Moominpappa frequently reading a royalist newspaper (Karjalainen, 2014, p. 94; 2014, p. 82).

Travels in space

The third Moomin book *Trollkarlens hatt* ('Magician's Hat') came out in 1948 (Jansson, 1948). It was the book that introduced the Moomins to the international audience. The book was translated into English by Elizabeth Portch and got the title *Finn Family Moomintroll* (Jansson, 1950). Portch also translated the comet book *Comet in Moominland* (Jansson, 1951) from the first (1946) version.

Trollkarlens hatt does not tell as much about the apocalypse as the two preceding Moomin books and the first cartoon series. The wide universe is present, however. A central character is the magician who lives on the Moon. The magician has a panther on which he rides at breakneck speed. On the cover picture of the first edition and in one illustration of the last chapter (Jansson, 2010, p. 148), the magician is seen sitting on the Moon with his panther (Fig. 13). On the background of a mountainous valley, Saturn can be seen. There are at least two sources of inspiration for the illustration. Camille Flammarion's *Astronomie populaire* (1880) became one of the most popular astronomy book ever. N.V.E. Nordenmark (1897) adapted it for Nordic countries in Swedish. The book gathered a wide audience also in Finland. In the illustration 72 on page 145 ('Ideal lunar landscape'), lunar mountains and valleys are seen illuminated by the Earth in the sky (Fig. 14).

Another possible source of inspiration are the paintings of Chesley Bonestell (1888–1986), a pioneer in space art. He made special effects and scene decorations

Figure 13. The magician and the panther on the Moon. Illustration from the book *Trollkarlens hatt* ('*Finn Family Moomintroll*' or 'Magician's hat') (Jansson, 2010, p. 148; National Library of Finland).

for Hollywood movies (Schuetz, 1999, *passim*). Bonestell studied how Saturn would be seen from its several moons. The paintings were published for the first time in the 29 May 1944 issue of *Life Magazine* (pp. 78–80) at the beginning of its article on the solar system. The idea of the story was to show that the system of Saturn with its nine moons known at that time would be like our solar system in miniature. In the years of World War II it was hardly possible to have a look at *Life Magazine* in Finland. In 1945, however, it became possible for Finns to visit Sweden, where the journal was available. Per Olov Jansson told in his interview that one could read *Life* at the 'Swedish family', i.e. at the relatives of their mother Signe Hammarsten-Jansson in Stockholm. According to Per Olov Jansson, the journal was very interesting because it pioneered illustration journalism at that time (Jansson, P. O., 2015).

The most important paintings of Chesley Bonestell were published in *The Conquest of Space* (Bonestell & Ley, 1949), which turned out to be one of the fanfares of the space age. The book was published in Finnish, translated by Erkki Puranen, under the title *Avaruuden valloitus* (Bonestell & Ley, 1952). The landscape details in Bonestell's illustrations of the Saturnian moons Iapetus and Mimas may have well inspired Tove Jansson when shaping the space view for the magician's hat (Jansson, 1948). In her letter to friend Eva Konikoff (1908–1999), Tove Jansson called the picture a galactic image (Jansson, 2014, p. 257). Tove Jansson was inspired by space also later. In 1957, she published a cartoon series *Mumintrollet*

och marsinnevånarna ('Moomintroll and Martians'). The plot is a conventional space adventure with a Martian space ship landing on Earth, invisibility, weightlessness, followed by other fun (Jansson, 1989, pp. 31–66).

Figure 14. The ideal lunar landscape in the book of Camille Flammarion published in Swedish in 1897 (Flammarion, 1897).

Did the sky fall?

In the three versions of her comet book, Tove Jansson describes the appearance and influences of the comet convincingly. She was totally dependent on the published material, i.e. photographs and narratives, because since January 1910 no naked-eye comet could be seen on the northern hemisphere until 1957 (Yeomans, 2007; Bortle, 1998). An interesting question is whether a real cosmic event could act as a source of inspiration. In the history, there really was an event that could have influenced Tove Jansson in her early years.

Since 1920, the Jansson family spent its summers in the Pellinge archipelago, east of Helsinki, not far from the town of Borgå (Fin. Porvoo). Tove Jansson's last summer cottage was on a barren islet Klovharun until she gave it up at the age of 78 in 1992 (Karjalainen, 2014, pp. 6, 272–273). She knew the region and people living there and possibly heard about the remarkable events of the past.

When the nights turned dark in August, looking at stars was a usual pastime for the Jansson family in the archipelago (Ulfsson, 2014). According to Helen Svensson (personal interview in 2015), Tove Jansson was interested in natural phenomena, "cyclones and the like".

At 9:30 p.m. on a Sunday evening, 12 March 1899, a meteorite fell from the sky on the shore of Bjurböle Bay, less than 20 kilometers north of Pellinge. It punched about 40 centimetres of ice covering the shallow sea water close to the shore. Pieces of the celestial stone were recovered for research from mud seven metres deep (Ramsay & Borgström, 1902). The meteorite arrived in the hours of darkness and it was widely observed in the Baltic region. The northernmost observation was from Ii parish about 600 kilometres from Helsinki. In the south the phenomenon was noticed at a distance of 700 kilometres south of Helsinki

Figure 15. Saturnus seen from its moon Iapetus. Painting by Chesley Bonestell published in *Life Magazine* on May 29, 1944, p. 79. Reproduced courtesy of Bonestell LLC.

at Grodnossa (Hrodna) in Belarus, near the border between Lithuania and Poland. A thunder lasting several minutes was heard over a vast area. In Helsinki the meteor was brighter than full moon and it had a long tail. Eino Kalima (1882–1972), later director general of the Finnish National Theatre, tells in his autobiography how he was surprised by the phenomenon in Helsinki.

> I specifically remember one winter night in my lodging. I was alone looking at the starry sky from my window facing south. Suddenly the sky was split and the space was filled with a dazzling light. I could only think this is the end of the world! There was a clap and the light was gone. It was not the end of the world yet. It was the Bjurböle meteorite that shocked the whole capital. (Kalima, 1962, p. 67)

In the last, 1968 edition, Tove Jansson gives a hint of connection between the comet and meteorites. After the comet has passed, Moomintroll comes out of the cave and picks up a meteorite flung by the comet (Jansson, 1968, p. 151). The meteorite is not mentioned in the earlier editions of the comet book (Jansson, 1946; 1956).

The idea of the Bjurböle meteorite being a possible source of inspiration for Tove Jansson was originally proposed by Ms. Sanni Turunen, MSc, and told to the present author on 21 January 2015 by Dr. Arto Luttinen, head of the Geological Museum of the University of Helsinki. It is possible that Tove Jansson could have heard some memories and narratives in her youth in the archipelago. In the 1920s, only one generation had passed since the dramatic event of cosmic dimensions. In Finland there are two archives which may hold recorded information about the event—the Folklore Archives of the Finnish Literature Society (SKS), the institution responsible for material in Finnish and of the *Svenska Litteratursällskapet i Finland* (SLS), which is responsible for material in Swedish. Throughout centuries, the Pellinge and Borgå (Porvoo) regions have been mainly populated by Swedish speakers. No record of the Bjurböle or any other meteorite was found in the archives, however. In the interview, Per Olov Jansson told that in his youth he never heard anyone of the permanent inhabitants of the Pellinge archipelago telling about the meteorite (Jansson, P. O., 2015). Tove Jansson never mentioned the meteorite to Helen Svensson while they prepared Jansson's books for print. Neither does Tove Jansson refer to it in her letters (interview with Helen Svensson in 2015). Helen Svensson edited a selection of Jansson's letters together with Boel Westin (Jansson, 2014).

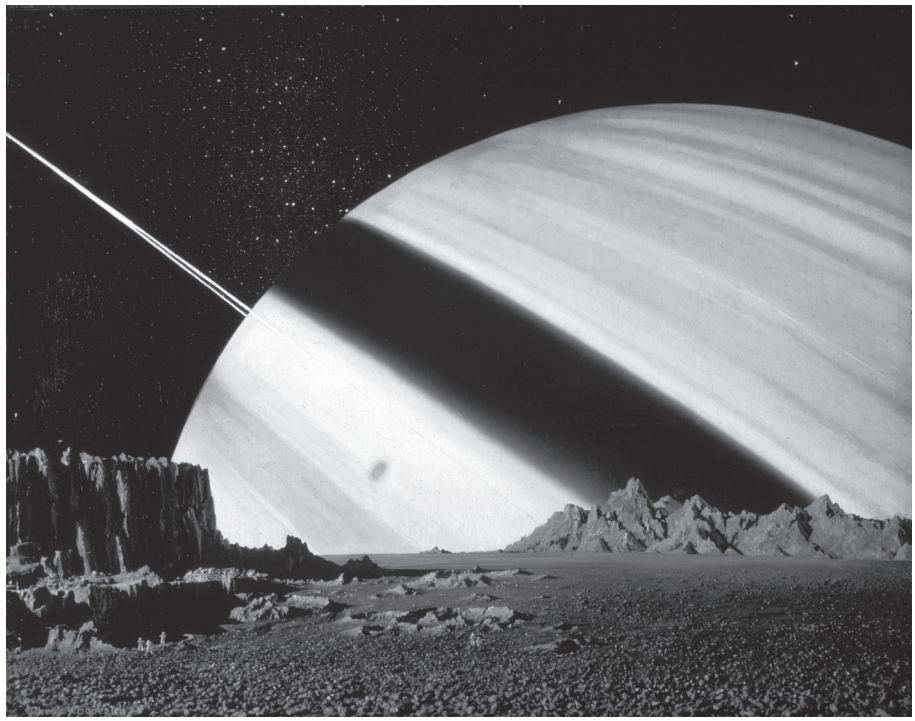

Figure 16. Saturn seen from its moon Mimas. Painting by Chesley Bonestell published in *Life Magazine* May 29, 1944, p. 80. Reproduced courtesy of Bonestell LLC.

The result is puzzling. The meteorite fell in Bjurböle during a dramatic phase of political history in Finland. Since 1863, the Finnish parliament in Helsinki worked regularly and made laws for Finland. In the late 1800s, Russia changed its policy and started actions to unify the multinational empire. A manifesto was issued by the Russian government on 15 February 1899 according to which the laws concerning Finland had to be conformed to the same procedure and system as any Russian law. In Finland, the February Manifesto was regarded as an insult to the constitution of the country. Since 1809, all Russian emperors gave an oath to keep the constitutional position of Finland. In Finland, more than half a million signatures were collected within eleven days all over the country to a plea to Emperor Nicholas II to withdraw the manifesto and to restore Finland's constitutional status. A delegation was composed with a mission to take the plea to the emperor to Saint Petersburg. The delegates convened on 13 March 1899 in Helsinki in order to take a special night train to the Russian capital. The meteorite crashed down in Bjurböle just east of Helsinki only the night before. Other natural phenomena also occurred in

1899. In the Saimaa lake area, the flood reached a record height—one metre above normal—and left a permanent mark on the rocks on the shores. In the Finnish lake district, the line is still commonly called "the line of the oath breaker", referring to the perjury of Emperor Nicholas II (Tommila, 1999, *passim*). It could be expected that there was some record in the folklore archives of the country of a natural phenomenon of the scale described above connected to a dramatic phase in national history.

Conclusions

Tove Jansson was a keen observer who used records of her memory in many ways in her artistic work as a writer and a visual artist. This article identifies many sources that may have inspired her. Tove Jansson wrote her book on the comet adventure three times altogether. Most of the changes in the text are of stylistic nature and serve to concentrate the message. In the last, 1968 edition, the date of the comet colliding with the earth was changed from 7 October to 7 August. In this article, it is suggested that the reason for that change was the transference of the cause of agony. At the time of writing the text of the first edition in early summer 1945, the fear of a possible Soviet occupation was widespread in Finland. By the late 1960s, it was no longer relevant and had been replaced by the fear of global nuclear war. In the background, these agonies and their change were reflected to Tove Jansson's Moominvalley. In her art, Tove Jansson discussed major life issues, like love, mutual trust, friendship and tolerance, fears and hope. The valley was wide enough for an individual and a small intimate community, and for world history and the universe alike.

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