

A BRAND NEW SKY

A poetic narration on Galileo's astronomical discoveries

Production: Institute and Museum of the History of Science

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The text of "A Brand New Sky"

Author's notes for an analytical reading

THE STAGE

The set is made up of three parts.

The House: characterized by a low platform with a door, a basin and a stool. It is a poor house. Here, Loon lives in conflict with society and the rift between his ideas (included those inspired by Galileo Galilei) and popular beliefs, astrology, and the Aristotelian-Ptolemaic worldview.

The Walkway of Stumps:

A sort of walking path, made up of tree stumps linked by bars of iron, which winds through the audience (considered "stars" in the play). It creates an image similar to the patterns of constellations. The stumps, as they lead away from the House, grow in height, giving the impression that, when Loon walks upon them, he is strolling among the stars, rising towards a path of exploration and knowledge. It is a symbolic space.

The Balcony: The Walkway of Stumps ends in a Venetian balcony made of wrought iron. From here, Loon gazes into the vastness and launches into his most poetic visions and recounts his fondest memories, such as his encounter with Galileo Galilei.

THE CHARACTER "LOON"

Each part of the text of "*A Brand New Sky*" is based upon verified historical and scientific data. The only fictitious element is the character Loon.

Loon is a glass artisan. He is educated but he comes from modest beginnings. He observes things in an unusual way and develops his own mixture of scientific and popular thinking. He embodies a figure in the midst of the social tensions of his time.

Loon is marginalized because of his strange ideas and his physical characteristics: he suffers from a mild form of epilepsy, which does not manifest itself in convulsions, but renders him unconscious for episodes of variable duration. In Loon's age epilepsy was not yet recognized as an illness, and it was shrouded in mystery and suspicion. In the play it is present without actually being mentioned. Thus if the spectators are not familiar with its symptoms, they grasp only moments of Loon's pain and absence. His other physical characteristic is rather more visible, and also engendered feelings of mistrust: Loon is left-handed. These two physical characteristics (one deeper, but hidden

and not declared, the other, minimal but evident) contribute to creating a character with particular ideas, devoted to the research of a different world, and perceived by society as "strange", to be avoided, even to be destroyed. One can sense aggression towards Loon in the surroundings, and it presages the violence that the power of the Church will shower on Galileo, a few decades later.

THE *SIDEREUS NUNCIUS*

Loon obtains a copy of the *Sidereus Nuncius* by going without food, and when he takes it out of his bag he quotes many parts that he has memorized. It is a revolutionary book, not only because of the ideas it contains, but also because of the way in which they are written.

The language is sharp and specific, but easily comprehensible, without frills, organized in analytical sections. It was a writing style that previously did not exist and yet would become characteristic of the new scientific language.

THE TELESCOPE

Even though Loon is a glass craftsman and has built telescope lenses, he is too poor to buy a set of his own. In one of the play's scenes he finds himself delivering two lenses to the controversial Friar Paolo Sarpi. From that meeting Loon is allowed to borrow them for one night.

Loon, thanks to a previous encounter with Galileo Galilei, knows how to make a telescope and he will prove its abilities during the night in which he will finally put together all the necessary pieces.

Thus we will see him assemble a telescope, observe for the first time the Moon and marvel at the sight...

THE TEXT OF "A BRAND NEW SKY"

The action takes place at night, between two of Loon's epileptic attacks.

The story begins with Loon slumped on the floor, leaning against the door, while he is regaining consciousness.

The text begins with:

*“The universe all around me.
No.
Me in the universe. It’s still so hard to fathom”.*

The theme, personal and scientific at the same time, revolves around the structure of the Universe, in the transitional period between the Ptolemaic system and a new system inspired by the Copernican vision, with the Sun at the centre of the *world*.

As Loon comes to, finding himself under the eyes of the audience is like finding himself beneath a starry sky. In fact, from the beginning, the actor addresses the audience as if they were a marvellous group of stars, a swath of the Milky Way.

The first story that Loon tells the stars is that of the memory of his old glassmaking master, who taught him to read and write and about the Ptolemaic system:

*... He made globes among the finest you could find ... you know what he used to say?
“Only God on high can make them any rounder than these. He made ten very big ones”
I was a child: and where are they? Can I see ‘em?
“They’re so transparent, you can’t see them; they’re above us ... no, around us.”
... But all I see is the sky!
“I said you can’t see them; we just know that they’re there because they support the fixed stars and the mobile stars and they all go round and round.”
Then I said: now I understand how they stay up there without falling.
“The Earth is surrounded by invisible globes called spheres ... the first seven support the mobile stars ... the closest to us is the Moon, which you can see well; around the sphere of the Moon lies the sphere of Mercury, then that of Venus, then the Sun, all inside one another, and then those of Mars, Jupiter and Saturn ...
around all these spheres lies the one that supports all of the fixed stars ... and then there’s another, just think how big, called the crystalline ...”
And then?
And then there’s the Emyrean which is heaven, abode of God and all the saints.”
And then?”*

And so on, until the story of how Loon heard about the Copernican system for the first time, when as a little boy he delivered a vase to the house of a senator.

Loon’s narration, set in everyday Venetian life between the end of the 16th- and the beginning of the 17th-centuries, sees the appearance of figures linked to the political, economic and religious life of the time: senators, professors, Peripatetics, astronomers and astrologers, carpenters of the Venetian shipyards (the “Arsenal”), and their foremen, Friar Paolo Sarpi and Giordano Bruno...

Every now and then, Loon talks about himself, of the ideas that are too difficult for him and that he can hardly defend because he lacks the arguments, but in which he believes, on the bases of intuition, hope, and the little knowledge he has laboriously acquired.

The text continues with a tale linked to the Loon’s craft. Lens craftsmen were not that important in Venice: in fact, in a town where nearly every profession had its own guild with obligatory membership for practitioners, there was no obligation for making lenses: anyone could do it, because it was not that difficult to make lenses of poor quality. In fact Venetian glass production activity was more concerned with colour and decorative refinements. It was in Florence that glass production was focused on precision and scientific applications and the Florentine skill in lensmaking was recognized throughout Europe. It was there that a craftsman’s abilities were valued:

*“But I do know how to make lenses for spectacles. And of the finest: like the ones they make in Florence!
I spend hours smoothing and grinding the lens to give it the right curve; I also know how to avoid bubbles and maintain density in crystal ... here in Venice, nobody really cares about my lenses. Coloured and blown glass, mirrors and vases, ornaments: that’s all they care about here in Venice!*

Loon! What are you doing with your left hand? ... They only call me to make lenses ...

But I know other trades as well ... and I’m damn good at them ... “gifted hands” they say ... and I reply: there’s thought behind them! When they give me something to do, anything, I do it my way ... then they get angry, even though it’s well done, ... “you’ll get into big trouble one of these days, Loon, doing it your way!” But it’s well done ... so making lenses is all they let me do.

*...
Lenses should be made to have the greatest precision, like the ones made in Florence, because glass exists to be looked through, it must be transparent! ...*

Another driving theme, which runs through the text beyond the aspects more closely related to scientific discoveries, is the importance of “know-how”. It was a fundamental aspect for scientists like Galileo Galilei and their vision of modern science.

In Loon, his ability or difficulty in working closely with others is also an indication of the degree of his difference in approach, means, skill, and vision of the world, even when dealing with a simple task such as loading wood into an oven for melting glass.

After talking about his job as a lens craftsman, Loon takes out a copy of the *Sidereus Nuncius*, which he managed to buy through hard work and going without food. He recites

to the stars the first part, where Galileo briefly explains the contents of the book:

Oh! The Great Galileo Galilei. Great because 1610 will be remembered as the year the universe changed, thanks to his starry messenger, his Sidereus Nuncius! In Latin! As all important things are written. That way, they can be read by all scholars, even from different countries, churchmen, the powerful ... the cultured rich and those like me who have had the luck to learn to read and write ... though remaining wretched.

While reciting Galileo, Loon moves for the first time towards the walkway of stumps. It is his first flight to the stars.

But in returning towards to the door, in contrast with the heralded wonders, he summarizes the trials and oppositions that Galileo has had and still has to face because of these discoveries: the night hours spent in observation, the resistance of his colleagues at the University of Padua and of the Peripatetics ... but Loon speaks also of his own difficulties as an ordinary craftsman, who states unusual ideas. He talks about the papalists, the risks of the Inquisition, and about what happened to Giordano Bruno only ten years before...

After this “panorama” of scientific, political and religious relationships, Loon casts himself into the observation of the Milky Way, seen for the first time as a star cluster: a quantity of stars too great to be counted. And in this new Milky Way, Loon starts to see his “New Sky”.

“This means that the sky is completely open, that we’re not inside a large shell, and that it’s all so much vaster. Vast and possible!”

Next Loon relates his encounter with Friar Paolo Sarpi. When Loon delivered to him a couple of lenses he also had the opportunity to discuss the qualities of glass, the characteristics of lenses and the way to see through them.

“Who can say, though, ... that what we see is actually what is on the other side? And if it is, who can say, without making a comparison, that what we see is the same as the original?”

The accidental fall of an apple on Loon’s head inspires a series of statements that characterize, a little bit comically, the historical period: the laws of Newtonian mechanics are still in the distant future, and Loon does not find any meaning in the occurrence, aside from the cue to make fun of the soothsayers, who take such signs to be portents of any number of events.

Afterwards Loon is sitting on the balcony, and in intimacy with the stars recounts two crucial stories: one about the first time he saw Galileo Galilei (at the Arsenal, among the carpenters and overseers, observing the new technical inventions and studying their possible effects on science),

the other about the time Loon went in search of Galileo to ask him how to build a telescope.

It is thanks to the secrets learned from Galileo himself that Loon will be able to collect the necessary pieces to make a telescope with which to see the Moon.

In fact it is during the night of this tale that Loon can observe the Moon with the same rapture as when he read the *Sidereus Nuncius*.

“Gooseflesh covered my back as I read the description in Galileo’s book, of how after looking through the telescope at length, he saw the shadows of the moon change and reveal the height of the mountains and the depth of the valleys. I felt as though struck by sudden fever. And there I stood in the square reading, in astonished immobility. Near Tommaso Baglioni’s printing works, I met the gaze of at least two other persons afflicted by the same fever”

But the actual vision of the moon through the telescope – even if he has already read about its true composition in the *Sidereus Nuncius* – gives rise to unpredictable feelings. Here the observation and the scientific knowledge arouse emotional reactions and questions in his consciousness: seeing that the moon is not made of crystal, but of earth, with valleys and mountains can be a marvellous discovery and yet in some way disturbing.

The tale ends with Loon on the verge of another attack, moved by the reality of Galileo’s astronomical declaration, happy to be able to think of a new universe where he, like the others, is travelling through space and no longer the outcast Loon. At the same time he is afraid that it may be a joke or a self-delusion. He is full of both happiness and fear of a possible world.

Tommaso Correale Santacroce

Notes on the Project

“*A Brand New Sky*” is first of all a cultural project that takes shape in an experimental activity in the communication of the history of science through narrative. It was produced by the Institute and Museum of the History of Science, Florence, within the EU project Worldview Network - Cultura 2000¹, which was devoted to the five historical figures that fundamentally contributed to build a new view of the Universe: Nicolaus Copernicus, Johann Kepler, Tycho Brahe, Galileo Galilei and Isaac Newton.

Worldview Network had as objective the creation of “products” for the dissemination of the scientific culture. Towards this means, the Institute and Museum of the History of Science produced the exhibition *Images and Measures of the Cosmos from Copernicus to Newton*² and the performance “*A Brand New Sky*”³.

A Brand New Sky was intended for small groups of museum visitors and it was oriented to convey the fundamental elements of Galileo’s early astronomical discoveries, as well as the cultural climate in which they came to light.

To create the text (a monologue of 50 minutes), we started with concrete scientific elements described in the *Sidereus Nuncius* and drawn from Galileo’s letters written immediately before and after the publication of the book (March, 1610). Then it passed through a poetic-narrative “transposition”, creating a unique mode of communication to the audience.

The initial idea was to set the scene in Venice, in September 1610.

The author of the text has chosen as the main character a skilled glass craftsman, Loon. He has a great deal of manual skill in making lenses, and he is educated enough to be able to read the *Sidereus Nuncius*, the booklet printed in Venice in 500 copies and immediately sold out, exciting curiosity and arousing astonishment all around Europe because of its revolutionary contents.

The same book, along with admiration, caused a strong opposition, because it contained “new things”, based on the observation of the sky through the telescope. They carried a “subversive” potential, because they went against traditional knowledge. In the *Sidereus Nuncius* Galileo announces that he has seen the Moon’s surface, rugged, earthly and mountainous - not at all perfect as it was in Aristotelian cosmology. He announces having seen the myriad stars of the Milky Way and the satellites of Jupiter, four astral bodies orbiting around the planet.

Loon tells about all these things, from the point of view of a person totally out of the mainstream: he does not belong to the guarded elite, he suffers from epilepsy, he is very skilled as a glass artisan but is left-handed and he does things “his own way”, and even if he does them well, this

attitude provokes the antipathy of many people. Moreover he is a friend of Friar Sarpi, who, although he is the theological advisor to the government of the *Serenissima*, the Republic of Venice, he is disliked by the members of the Inquisition – so much so that, only three years before, he was the victim of an attempt on his life.

Loon is fascinated by Galileo and interested in the new cosmology. He is curious, he wants to understand and above all he wants to meet Galileo. He attended some of his lessons at the University, and he saw him in Venice, in the Arsenal. He will succeed. It will be a brief meeting, but full of emotion. Afterwards, Loon will be able to make a telescope himself. And the tale ends with the observation of the sky, the moon and the stars. The ending will remain open... if the sky is like this, if it is no longer the perfect one described by the Aristotelians, if the Sun is in the middle with the planets orbiting around it, then why do they do not fall on us? Why do they “stay up”? And, in the beginning, who started the planets spinning? And is what is seen through the telescope true?

We return to the way this project has been realized: we started from few selected “scientific” elements (those related in the *Sidereus Nuncius*) and from a historical research oriented towards an immersion in the climate of the era, generated by the Galilean discoveries, with a perspective from “the bottom”.

The difficulty of the work was that of “translating” all of this material into an expressive form that would be “accessible” to everybody. No *a priori* choice of audience was made. Instead, we worked starting from the point of view that the ideas, and the meaning, carefully transposed in an artistic form, have an intrinsic universal potential of communication, at different levels of comprehension and involvement by the audience. The text, in the actor’s interpretation, is open to many degrees of listening.

In substance, we carried out an experimental attempt not only to interweave science and theatre, but also to bring to light some fundamental contents of our culture (as was fundamental the process of changing perspective caused by Galileo’s work in astronomy), to bring them forth to all of us, individually and collectively, who belong to this culture.

Silvana Barbacci

¹ <http://www.worldviewnetwork.org/>

² http://www.imss.fi.it/news/emachina_mundi.html

³ <http://www.imss.fi.it/news/icielo.html>