ASTRA NEWS

18

Image from Official SpaceX Photos on Flickr.

Super Heavy 31 Engine Static Fire.
Image from Official SpaceX Photos on Flickr.

Hello, and welcome to the 18th issue of Astra News!

Have you ever felt as if you were a part of everything? Such a feeling does not overtake you but instead allows you to feel that you're part of a larger whole. It might be in one of these moments when we're able to experience our own immortality, the beauty of relating to something greater than ourselves.

This feeling is evoked by stargazing. But when was the last time that you saw a starry sky? Our cities' lights dim the sky, and it's not just that; gazing at the starry night might have been enough for our ancestors, but not anymore for us. When knowing what a vast expanse stretches beyond the sky that we see, one can only want to see further.

To those who push the boundaries and open a brand-new sky for the human race, we dedicate this issue!

To the stars!

Yours,
Max and Leonid *March 31, 2023*

*When looking at the cover above, please turn **THIS** music on, the beat "**March of The Martians**" from "The Happy Moog!" (1969).*

On the cover: a collage by Leonid Vishnevskiy, images are from the public domain, including an image by ***Pramod Tiwari*** and an image by ***gryffyn m*** from Unsplash.

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ĪMPRESSĪONS

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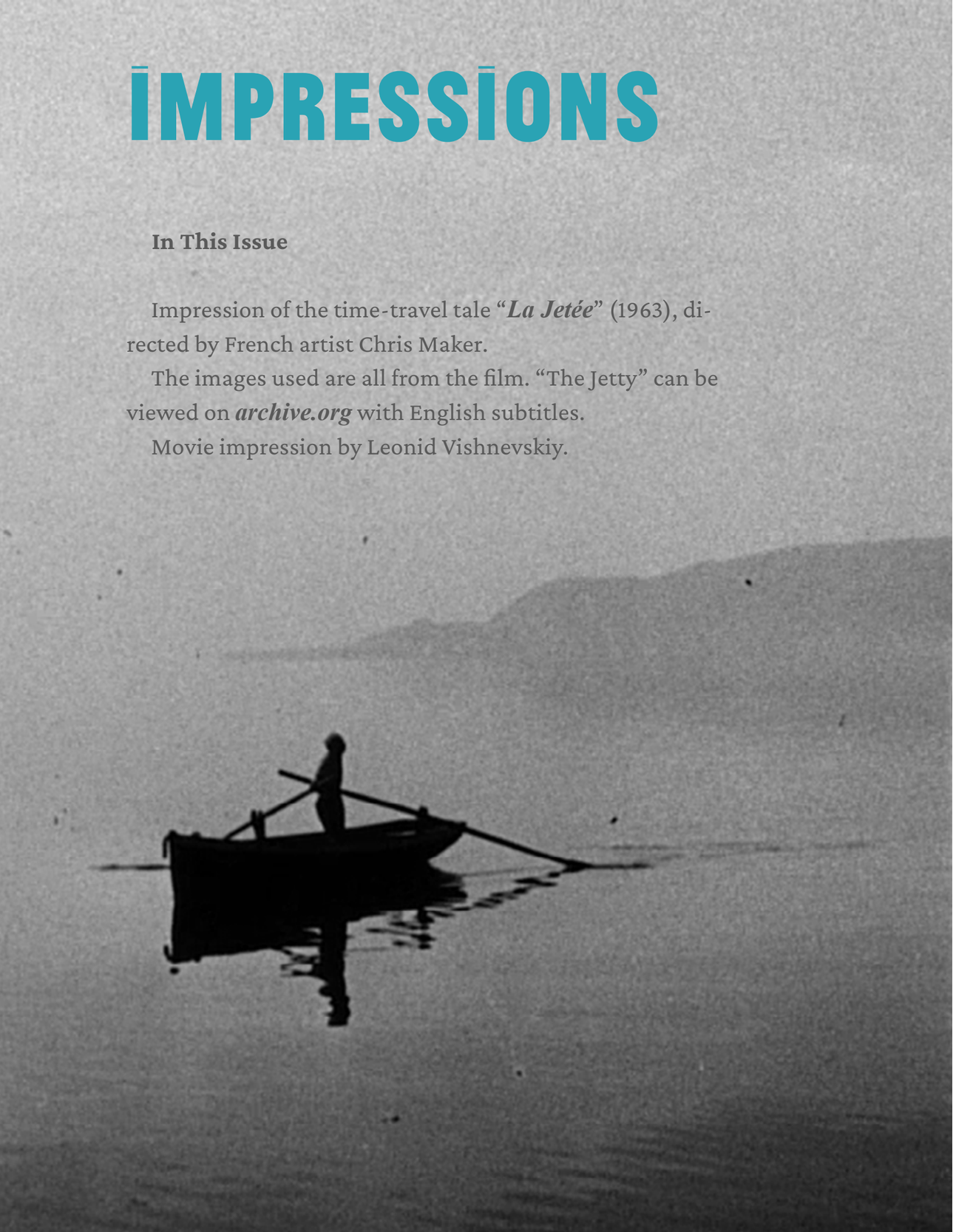
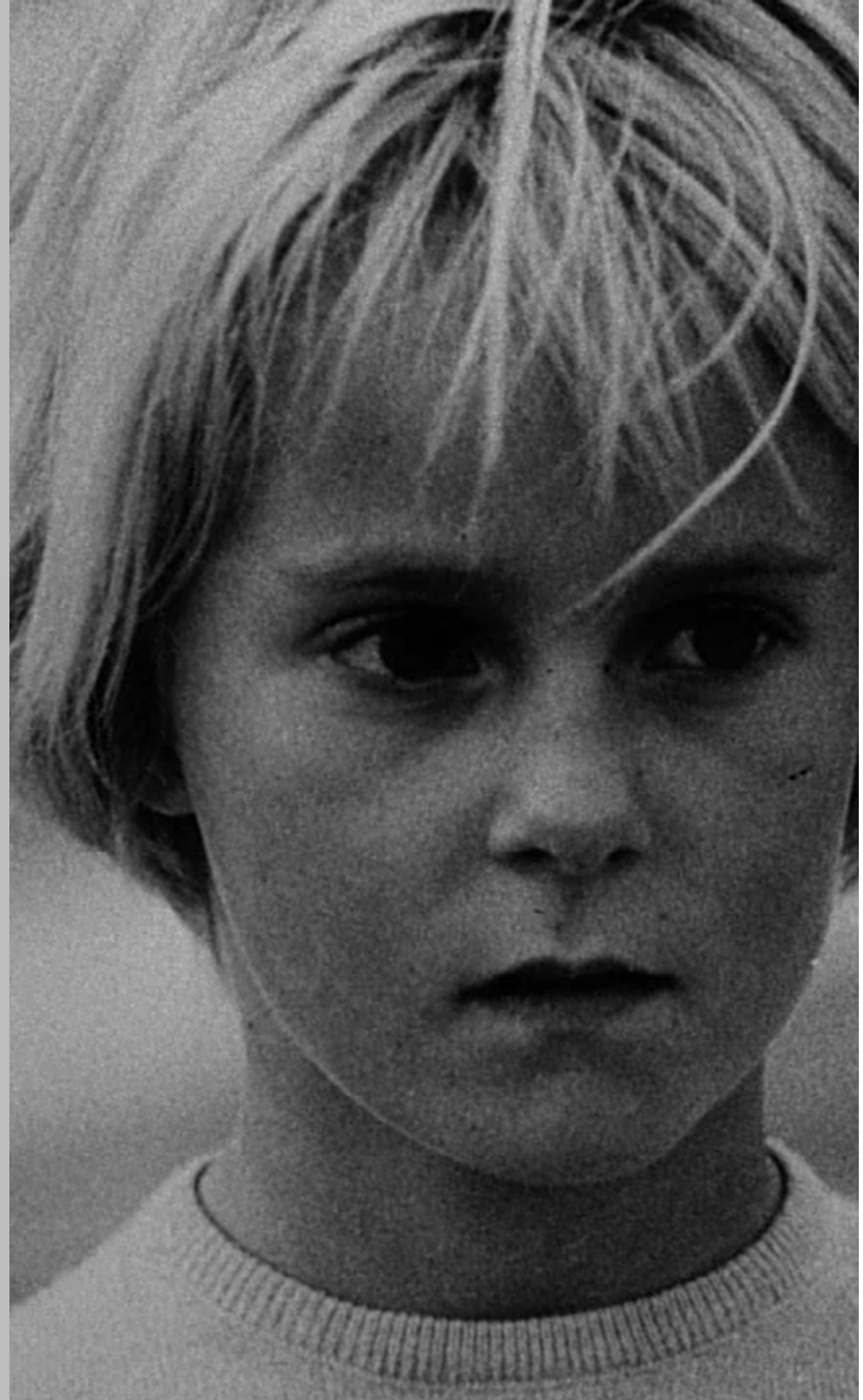
Impression of the time-travel tale "***La Jetée***" (1963), directed by French artist Chris Maker.

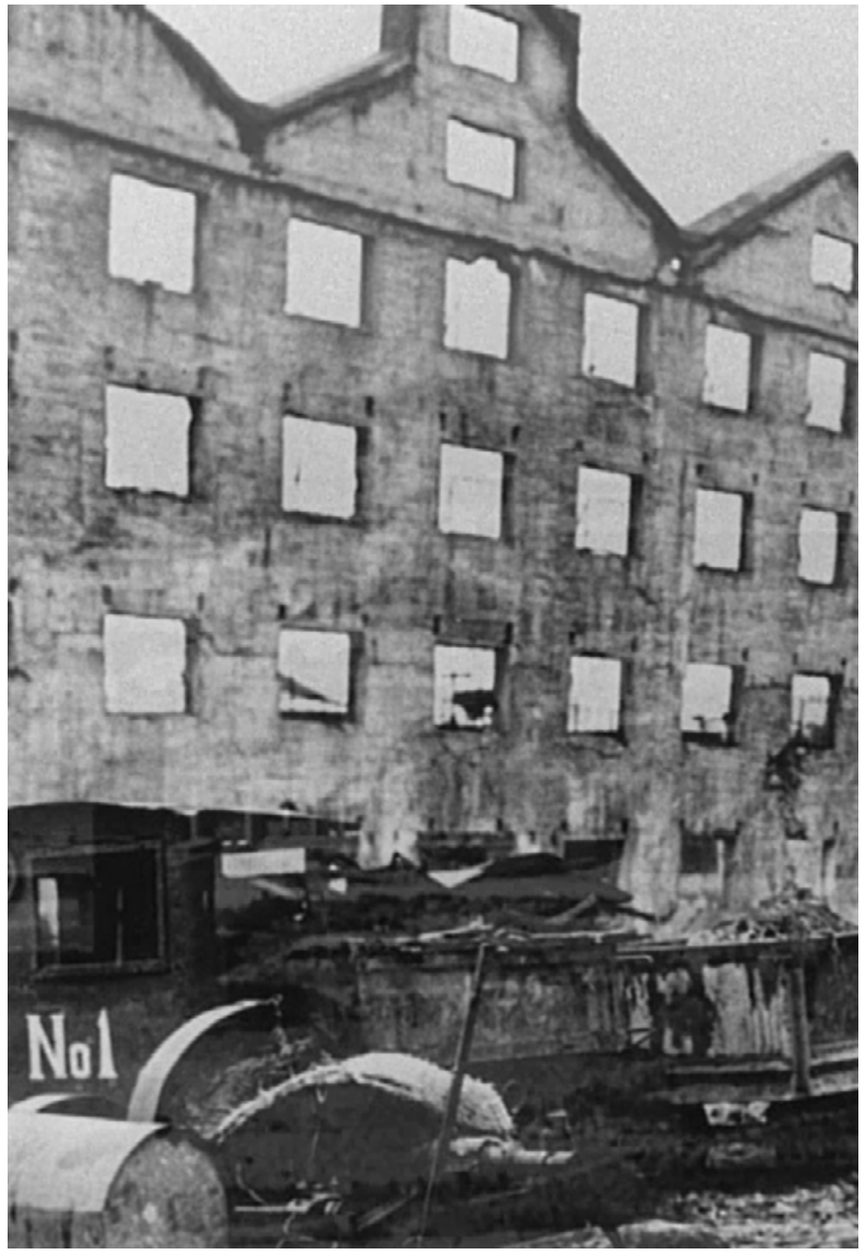
The images used are all from the film. "The Jetty" can be viewed on ***archive.org*** with English subtitles.

Movie impression by Leonid Vishnevskiy.



La Jetée





A collection of black and white photographs make up this 28-minute movie. The illusion over time that it is at 24 frames per second, while the photographs change at a slower rate, is created by various editing techniques, including a narrator and sounds. Music is present in the movie too. The soundtrack is tragic, much like the story, as it seems at first. However, the more time that passes after I watch it, the less certain I am that “La Jetée” is just a sad story. Furthermore, the director mentioned that he had no clear understanding of what he was filming. Since it is more of a work of art than a feature movie, this is not at all surprising.

“La Jetée” was the inspiration for the feature film “12 Monkeys“ (1995). Their plot foundations are so similar that if you’ve seen “12 Monkeys”, you’ll know how “La Jetée” ends. Despite this, the films are very distinct, owing to the fact they were made in different genres and were made great in them respectively.


El Sam

Plot Summary

World War III happens. Paris lies in ruins and is contaminated with radiation. Habitable space is limited to the cramped underworld, lacking in life support. To continue, people must learn to time travel.

Among the survivors, there are two social groups, the experimentalists or the “lords of the rats”, and the guinea pigs. Time travel is a challenge in and of itself. Man must be reborn. Some guinea pigs die, and some go insane. Experiments are continued.

At last, time travel is accomplished by someone who is related to the past by a deep childhood memory, and this man is our nameless protagonist. Eventually, he meets all of the lords’ demands and, as a result, fears for his life. Fortunately, he is given a chance to escape the deadly underground. Even so, he desires something else instead.

The Clock of Time Travel

Draw a circle around the boatman to reveal a clock (page 7). It could be tempting to see Charon the soul ferryman as the boatman when the underworld is mentioned. However, I believe that the boatman’s identity plays no part at all; the only thing that matters is that the hands of the clock are set in motion by someone.

Oars up and down, going forward--if forward exists in an ocean, sea, or lake. Consider a clock whose hands become stuck, keeping you trapped in time while you go on with your life. For us, humans, if there is such a thing as a clock for time travel, it should probably be this one. In other words, while traveling to, say, the year 2123 may seem thrilling, do we truly leave the year 2023? Our memories shape who we are and where we are, with the ability of reconstruction.

More About “La Jetée”

One of the main themes of this film is love, and it could have been a sad one if we interpret it straightforwardly. But what we see in the film, I believe, is a tale of love as a desire for something infinitely dear to us. The manifestation of this imagery in the movie is the lovely stranger. Before us is a love story itself, not a love story of the protagonist. If so, to acknowledge its sadness would be to refuse our pursuit of beauty.

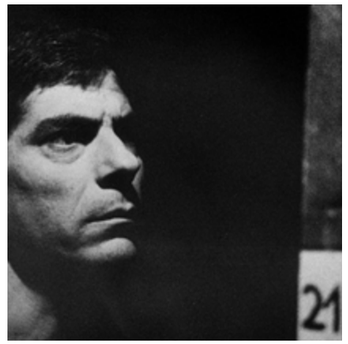
But watch the movie and decide for yourself.

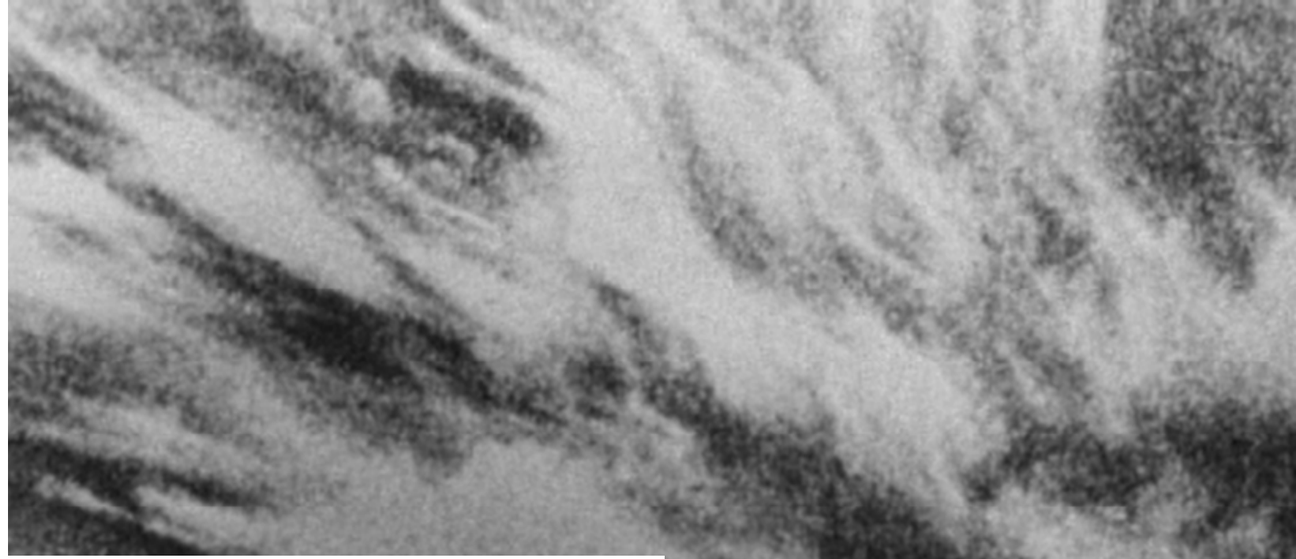
Of all the still images in the film, there is a single moving image, and it is the blink of an eye. We usually do not notice the blinking of our eyes until we snap a photo, and then consider it bad. Yet it turns out that if you do everything the opposite way around, that is, show a blink of an eye among still images, then it is beautiful.

There is a lot to examine in this film.

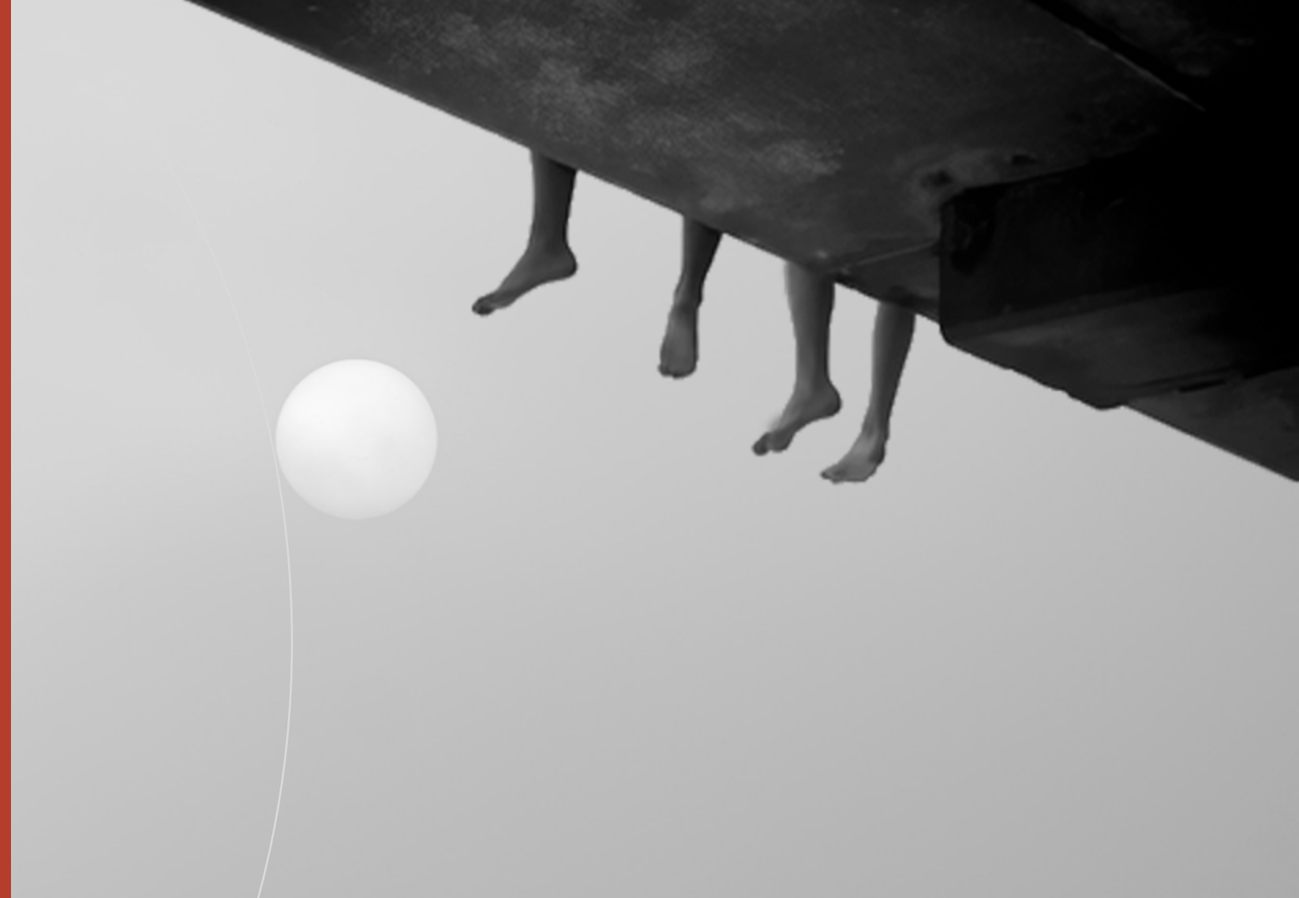
This is a wonderful film, and I especially recommend it to those who are interested about time travel from the perspective of memory. “Moon” (2009), a comparable film, was discussed in the previous issue.

FÍN





NON FICTION



FICTION

▲ Collage by Leonid Vishnevskiy. Images used are from the public domain including an image by ***Jorgen Hendriksen*** from Unsplash.

WHAT IS EN-TRO-PY?

By Leonid Vishnevskiy

Entropy. A term you may have heard before, but is quite hard to wrap your head around. Something that, in time, will make the universe cold and lifeless. What is it?

Entropy is described as “the measure of the disorder of a system”. What is disorder, though? It’s something that seems really arbitrary and hard to pin down. In another definition, entropy is described as the measure of the probability of energy distributions.

Let’s imagine you have 2 boxes and 16 unique balls. Think of the various ways you could arrange the balls in each box. Maybe 8 in one, 8 in the other. 7 in one, 9 in the other. Or, in an extreme case, 16 in one, 0 in the other. Remember that here, each ball rearrangement counts. That is, if you have 8 balls in one box, and in that box you shift two balls, that counts as a rearrangement. What do you think are the more probable distributions? As it turns out, the evenest distributions are the most likely distributions. This is an example of a “normal distribution”—imagine it as a curve assigning outcomes to probabilities, with the curve being lowest at its extremes, and highest at its mean (average).

Now, let’s imagine a similar scenario, but instead, take some piece of matter. Let’s imagine one unit of energy as something that can be moved around (just like the balls). Place 8 units of energy on this piece of matter, and 8 on another. Now, connect the matter.

There are various ways that you can arrange the energy on each piece of matter. Let’s take these few examples: 16 on the left, 0 on the right; 0 on the left, 16 on the right. These are two “clumped” distributions of energy. Now let’s think of a few more even distributions: 8 on the left, 8 on the right; 7 on the left, 9 on the right; 9 on the left, 7 on the right; etc. The more spread-out energy combinations would be more likely, as with the balls.

To see what this implies, we will use the example of a hot cup of water, with ice placed inside. The ice has much fewer units of energy than the hot water. Intuitively (and this is correct), the ice should melt (heat up) and the hot water will cool down. Let’s examine this from what we just learned. The hot water originally has more units of energy than the ice (which is why it is hotter). As the units of hot energy from the water go to the ice, the water becomes less and less hot. Eventually, their temperature is the same. If their temperature is the same, the energy has fully spread out (it has become even). However, we only say that energy is most likely to spread out.

Image ***source***

In theory, the rearrangement could reverse, with the ice instead cooling down, and the water heating up (energy from ice → water; remember, even though the ice is cold, it still has energy)! Why don't we ever see this? Technically, it's possible, just it is extremely unlikely. The scenario we examined earlier with the 16 units of energy has a small number of energy units. Water and ice have many, many more energy units. In macro scenarios like this one, there are so many that it is almost entirely improbable that at any moment the water will heat up and the ice will cool down (energy from ice → water). So, it can happen in theory, but not really in practice. It is just too improbable to actually see this on a large scale.

What's interesting about this is looking on a small scale. On a small scale, with much, much fewer "energy units", there is a small, realistic chance that within that minuscule system, energy will not spread out. This is because there are a lot fewer energy units, so there is a larger chance of extreme cases happening. Why does this probability disappear as we increase the scale?

Let's imagine this intuitively with coin flips. Say you flip a coin 5 times, and get 4 heads, 1 tail. That seems a bit unlikely! Nonetheless, it can totally happen. In this case, the ratio of heads to tails is 4:1, while it would most likely be 1:1. However, your streak will likely run out. If you keep flipping, you will find that the average ratio of heads to tails will approach 1:1. So, in individual cases, you could have extreme values, but over time it will regress to this predicted ratio.

The same with entropy! You may have tons of minuscule systems where energy won't spread out, but you'll also have tons of minuscule systems where energy will spread out.

We discussed entropy as probability distributions. If you were to assign a number to entropy, what would it be? The value itself is the amount of thermal energy per unit temperature that is not available for useful work (note: work here is a physical concept, not the commonly-used word in daily life). Energy becomes less useful as it spreads out. For instance, in a car engine, you have concentrated clumps of energy form in the pistons, which propel the car. Some of the energy later spreads out as the exhaust, and it can't be reused with ease. It's the concentrated energy that makes the car move. So basically, it talks about the amount of energy that you cannot use for anything practical. That is, say you want that energy to go towards moving pistons in a car engine—that is practical work. If it's just spread out, it doesn't really do anything.

So, the higher the entropy, the less useful the energy is. While we can do something with this "useless" energy, it is very difficult.

What does this mean for the Universe? You may have heard something called the "Heat Death of the Universe" before.

Image ***source***

Going back, entropy states that energy will always seek to spread out in an isolated system. An isolated system is something that has no external forces. Why can't it work in an unisolated system? Because outside energy can be transferred to the system in that case. Take again, the cup of hot water with ice. If it is an isolated system, only the hot water and ice affect the system. So, it cools down. Say you were now to place a random, arbitrary cup outside on a hot summer day. It would get hotter, right? Here, the forces external to the cup (e.g., air temperature) heat it up. It is no longer an isolated system. Now, in the cup, entropy would decrease, as more and more energy gets concentrated in the cup and it heats up. In return, the entropy outside the system would have to increase (the heat of the air enters the cup, which decreases the amount of energy outside, thus decreasing the spread, and so entropy would increase).

The universe itself is an isolated system. Nothing else acts on it--as far as we know at least.

Currently, the energy in the Universe is spread out in many clumps. Stars are some notable clumps, for instance. Eventually, by this principle of entropy, all energy should be evenly spread out, and everything will be at the same temperature. This temperature would be almost absolute zero! Absolute zero is the temperature when everything stops moving—remember that a basic definition of "temperature" is the velocity of particles. Everything would be cold and lifeless. This is the state of maximum entropy.

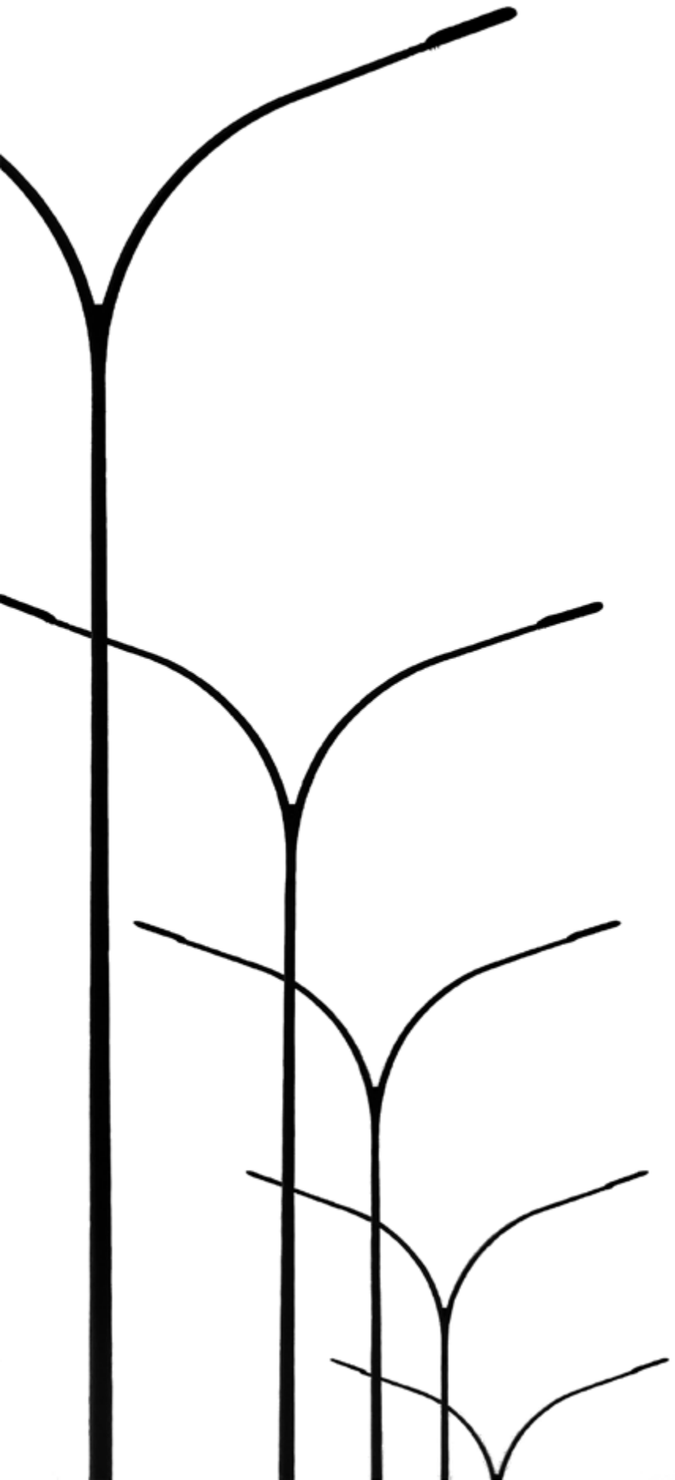
Not to worry though, as this won't happen for some trillions and trillions of years. Maybe our theory will change, as it has before. We seem to never truly know what the universe is like.

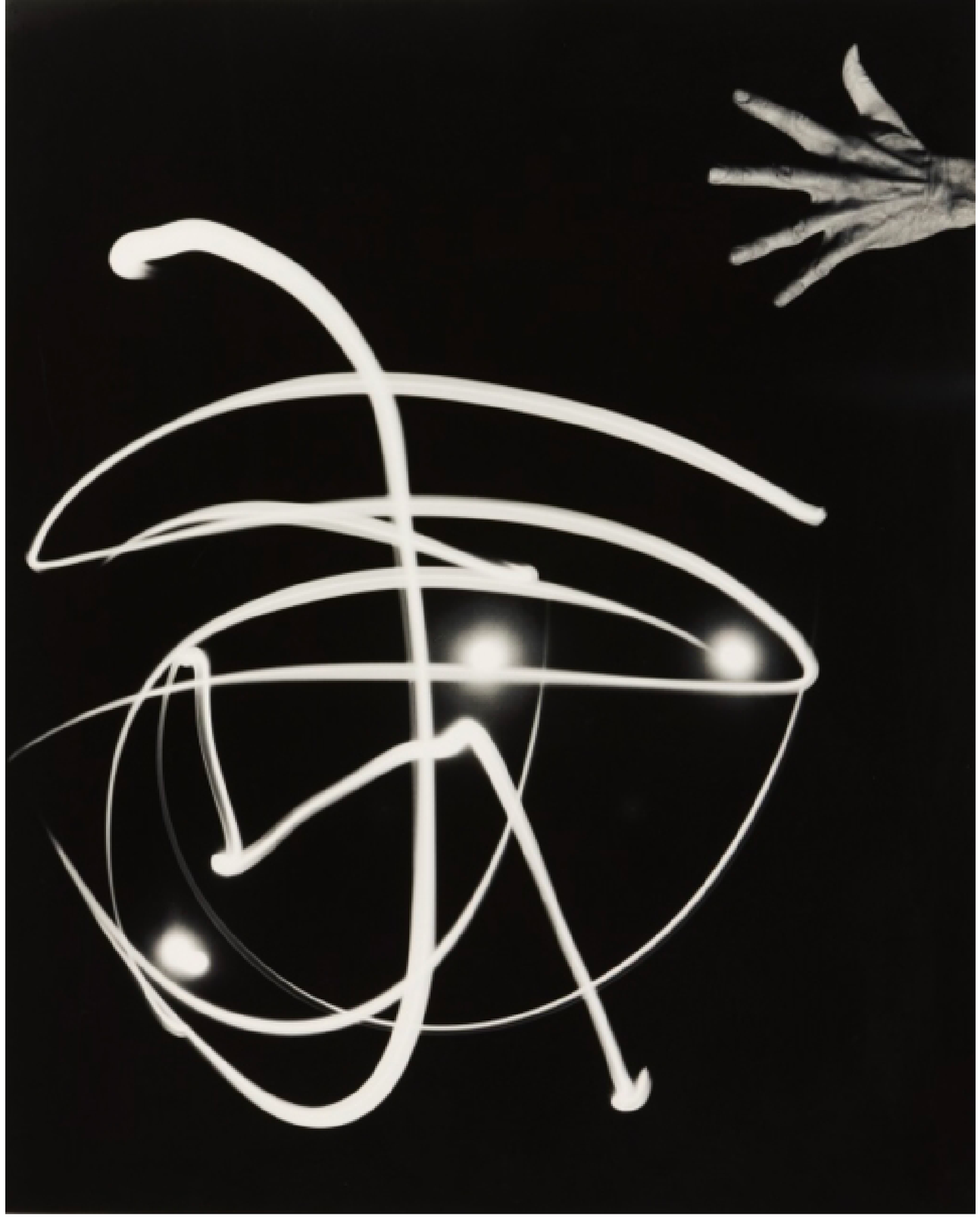
Fiery Hourglass as New Star Forms. Image ***source***

Send your surreal
collages, drawings,
paintings, or photos.
The name of this rubric is

The Hill That Dug Itself Out

◀ Collage by Leonid Vishnevskiy. Images used are by
Mikita Yo from Unsplash and "***A Boy, Carmel***" by Johan Hagemeyer.





Being Light

Composition by Leonid Vishnevskiy. Images used are by ***wu yi*** from Unsplash and "***Pure Energy and Neurotic Man***" by Barbara Morgan.

Black Square
and
White Circle

◀ Composition by Leonid Vishnevskiy.

Net Works

◀ Collage by Leonid Vishnevskiy. Images used are from the public domain including an ***image*** by NASA.

The Watcher

◀ Collage by Leonid Vishnevskiy. Images used are from the public domain including an ***image*** by Jan Huber from Unsplash and an ***image*** by Colin Cassidy from Usplash.

The City of Gold

Collage by Leonid Vishnevskiy, images used are from the public domain inluding an image of ***Martian Crater Depositsts*** by NASA and an image by ***Emmanuel Phaeton*** from Unsplash.

“The City of Gold”. Tale of a Song

By Leonid Vishnevskiy

An image from “ACCA”

Listen to “The City of Gold” HERE

The City of Gold[1]

By Anri Volokhonsky
with some changes by B. Grebenshikov

Under the blue sky a golden city lies
With crystal gates and the bright star
And there’s a garden in that city all herbs and flowers
Animals of unprecedented beauty roaming there.
One’s like a yellow lion with red mane
Another’s like an ox with many eyes
With them a golden eagle of heaven
Whose gaze is so bright and unforgettable.
In the blue sky the only star’s ablaze
It’s yours, my angel, it’s always yours
Who loves is beloved, whose spirit’s pure is blessed
Follow the star to a wonderful garden.
The red-maned lion will meet you there
And the ox with many eyes
With them the golden eagle of heaven
Whose gaze is so bright and unforgettable.

1 Translated from Russian into English by Leonid Vishnevskiy.

The music for this song was composed by a man who had chosen to stay anonymous, and the lyrics were written by a poet who was long unknown as the author.

It all started in 1970 when lutenist and guitarist Vladimir Vavilov recorded “***The Lute Music of the 16th-17th Centuries***” on a vinyl record. It began with a suite called “Canzone and Dance,” the composer of which has been credited as Francesco da Milano, while the piece (and all others except for two) was actually written by Vavilov himself. The record quickly gained popularity.

Around the same time, Anri Volokhonsky wrote a poem that started with “Above the blue sky”. Aleksey Khvostenko, a friend of his, combined this poem with “Canzone and Dance” and performed the song for the first time. However, back then the song had not reached widespread popularity yet, having been sung only among a narrow circle.

Boris Grebenshikov then heard the song. He didn’t know the true author, and continued to assume Francesco da Milano was the composer.

The original wording was changed, mainly unintentionally, when he recorded this song for his band’s CD. Instead of “above the blue sky” it became “under the blue sky”, and instead of “and the bright wall” it was now “and the bright star”. Also, the name of the poem and song changed from “Paradise” to “The City of Gold”.

Only in the year 2000 was it revealed who composed the music and who wrote the lyrics, thanks to the enthusiasts who took the time to figure it out. By that time, however, the song was already well-known due to the film “***ACCA***” (1987, pronounced “ASSA”), which featured a song performed by Grebenshchikov.

It’s a beautiful song that I wanted to share with you.

We wish you a happy spring and we are waiting for your articles for the next issues!

▼ Starlink Mission.
Image from Official SpaceX Photos on Flickr.