Daniela Friebel
events

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GALERIE
M29
RICHTER
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Öffnungszeiten: Mi – Fr 14 – 18 Uhr
Sa 12 – 16 Uhr u. n. V.

There is an alternative explanation which cannot be excluded in principle although it is very improbable *

Daniela Friebel embarks on a scientific, aesthetic and private search for traces in the archives of the Nuclear Physics Institute of the Academy of Sciences (GDR, Berlin-Zeuthen in the early 1950s), where her father used to work.

She uses archive images and films, documenting scientific archive material with her camera, and in the process, infiltrates the microcosm of an archive box. She enlarges, examines details and opens a mysterious cosmos. As a photographer, she foregrounds the connection between photography and science in her installation. Here, the scientific process is inextricably linked to analogue photography.

Daniela Friebel seizes on the technique of nuclear emulsion: particles of cosmic radiation collide and become visible as a direct track in the photo emulsion. In physics, collisions are called *events*. In German, *event* in its original meaning means an event that comes to light; is witnessed (an *eräugnis*). Accordingly, it's all the more about observing and making events visible.

Photography is often described as a window onto reality, an immediate projection: projecting the outside inwards, preserving reality as a direct trace on the paper. With the camera, space and time are recorded, and this moment is preserved as a document and transformed into a tangible and viewable image. Photography changes reality, translates and interprets it. Like a magical black box, photography allows the invisible to become visible.

Friebel raises questions about what really exists and what remains hidden from us, and what we perhaps overlook. Perception is always a reshaping, an interpretation, a filtering, a concealment and simplification of reality. It shows us the outside world not as such, but as an inner projection. Physically speaking, reality is an uncertain state: diffuse, meaningless, random, full of inconsistencies, errors and imbalances. Through observation, we integrate the uncertain and the inexplicable into subjective stories and systems of order.

Babette Richter

* from: The Study of Elementary Particles by the Photographic Method. Powell at al., 1959

SEARCHING FOR TRACES

Who didn't like releasing balloons into the sky as a child and watching until they faded into the distance, never to be seen again? In the 1930s, 40s and 50s, it was — paradoxically — nuclear physicists who indulged in this illustrious activity. However, the balloons they released carried a valuable load—nuclear emulsions—which they wanted to use to research cosmic radiation: a constant rain of charged particles that have been hitting the earth for billions of years.*

Until the early 1950s, progress in the field of elementary particle physics relied primarily on cosmic rays, before particle accelerators overtook them. High up in the outer layers of the atmosphere, the cosmic particles collide for the first time with oxygen or nitrogen nuclei and trigger entire avalanches of secondary particles. That's why early particle physicists were often seen on high mountains like the Jungfraujoch, wrapped in thick anoraks, peacefully united across national and system borders. They reached even further heights by letting balloons with the nuclear emulsions in question rise high up into the stratosphere. The emulsions consisted of layered — like a deck of cards — fragile gelatin plates in which silver bromide or silver chloride molecules were embedded. Along their path through the emulsion, charged particles encounter a series of silver bromide molecules, which appear as a line of blackened dots after development.

Not all that different from film used in analog cameras, actually, except in that case it's light that splits the molecules. The nuclear emulsions were however thicker than photographic films (up to a millimeter) and contained far more silver bromide; and they were clearly more complex to develop than the procedure for normal films, requiring a multi-step process that took several days.

Researchers from the Nuclear Physics Institute of the Academy of Sciences in Zeuthen south of Berlin also released balloons into the sky, ones containing nuclear trace emulsions. Sometimes they came back to earth in the GDR, sometimes in other countries. The finders usually sent the lost packages containing the emulsions back to the address provided, from the West to the East vice versa. Then the scientists leaned over their measuring microscopes and tried to decipher the stories hidden behind the traces of the particles.

Most interesting were the particles that not only ripped apart more than just a few silver bromide molecules, but that had collided directly with an atomic nucleus and triggered a nuclear reaction. From the blackening you could tell something about the type of particles; the number of tracks revealed something about the force of the collision, and, here and there, a sharp bend in a secondary track indicated that this or that particle had suffered another impact, or had suddenly disintegrated: tracking in service of physics, to a time long since past…

Dr. Christian Spiering

(Until his retirement, he worked at the Zeuthen Institute, which is now part of the large-scale research center DESY)

* Cosmic rays consist largely of atomic nuclei—hydrogen nuclei (protons), helium nuclei, nuclei of carbon, nitrogen and so on; up to iron nuclei and with a tiny admixture of even heavier particles. Their origins include, for instance: the sun, distant star explosions, or the surroundings of black holes. The most energetic of these projectiles have ten million times the energy to which protons can be accelerated in the Large Hadron Collider at CERN!