

**33**

**EDUARD BÄUMER**

**Cinematograph and Epistemology**

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From its early years, the cinematograph was noted for its ability not only to record, fragment, and re-present segments of time but also to stretch and contract them through the techniques of slow- and fast-motion. Written by a Berlin-based doctor, the following text examines the potential for motion photography to accelerate lengthy natural processes such as plant growth and thus to render otherwise imperceptible phenomena available for human observation and experience. Eduard Bäumer's essay recalls the studies of chronophotographer Étienne-Jules Marey and biologist Jakob von Uexküll and also anticipates Weimar Kulturfilms such as *Das Blumenwunder* (The miracle of flowers, 1926) as well as film-theoretical writings by Arnheim, Benjamin, Dulac, and Epstein. Invoking an intellectual-historical tradition of theorizing motion—one extending from Heraclitus to Constantin Brunner—Bäumer's text is also remarkable for positing the cinematograph as a potential medium of philosophy. In this regard, Bäumer diverges from Henri Bergson, who had famously deployed the cinematograph as a metaphor for "the mechanism of our ordinary knowledge" in *Creative Evolution* (1907).<sup>1</sup> See also Kracauer's text on time-lapse photography later in this chapter (no. 42).

Cinemas cannot escape the accusation that other than instructive and entertaining films, much of what they have to offer is bad. While the "dramas" typically proceed quite dramatically, they are not particularly beautiful. Alongside the repulsive and deceitfully sentimental films proliferate the most extravagant robber romances, and comedies are no better. Berlin's Urania made the commendable attempt to use the cinema as a tool for observing nature, and the preliminary screening of these efforts in "live animal pictures" [Lebende Thierbilder] deserves our highest praise.<sup>2</sup> Such films make the observation of living nature a pleasurable experience and lend cinematography a new objective. Why couldn't the cinematograph be employed even for the highest theoretical knowledge of nature, or for philosophy?

We shall assume that sensory experience shows us something completely different from the teachings of abstract thought. According to our sensory experience, the earth stands still and the sun moves, while science teaches that the earth revolves around the sun. Let us take an even more familiar example, our own body. In our sensory experience, it appears not to change for long periods of time. Abstract thought teaches us, however, that our body is in the midst of continual change and motion. Heraclitus said we cannot step into the same river twice; today we know that we also cannot see twice with the same eyes or reach twice with the same hand. Our body does not remain unchanged for even a moment. Our circulating blood constantly courses through all parts of our bodies; we continually take in and expel substances. These examples show that our sensory experience falsely perceives an isolated, material existence and a persistence that abstract scientific thought dissolves into continual motion.

The truth of the unitary, eternal motion of the world is not a new truth. It is already implied in Heraclitus's words "Everything flows."<sup>3</sup> However, we have long failed to recognize its universality, its "general validity and necessity,"<sup>4</sup> and thus to allow it the determinate influence it ought to have over the entirety of our thought. Constantin Brunner demonstrated the universality of the doctrine of motion in his main work, *Doctrine of the Spiritual Elite and the Multitude*,<sup>5</sup> unfurling a grandiose world picture to which no work of ancient or modern literature can compare. Brunner was the first to conceive of the doctrine of motion in its complete depth and entirety and to demonstrate to us that the essence of this material world, this relative reality, lies in motion.

Motion photography must be enlisted in the service of the doctrine of motion, the last and highest understanding of nature; in this area, as I will attempt to demonstrate, cinematography will attain a heretofore-unimaginable significance.

We know that the organization of our senses is naturally limited. Where possible, we attempt to extend these limits in the interest of continually improving our knowledge of nature and in order to bring things indirectly into our purview that cannot be considered directly. There are many such means for expanding our sensory experience: for example, the telescope, the microscope, and the spectroscope. The moving picture camera, too, can help us to expand our sensory experience, to perceive movements that would otherwise remain imperceptible.

Motion is only recognizable for us when we perceive a change of location, “a change of the sequence or the realization of another sequence.”<sup>6</sup> A change of location means not only the transfer of an entire object from one place to another but also every transformation within the object itself; every change of state is a change of location or a movement of the object’s parts. Take the motion of plants. It is not directly visible as motion; plants appear immobile in our sensory experience. For this reason it is so difficult to convince children that plants are alive. My five-year-old son once answered me, outraged, “They are alive? But they don’t move!” The motions of growth, heliotropism, and geotropism are not directly visible to us because they are so slow and take place in such small increments that our eyes cannot grasp them as motion. Few plant movements occur such that we recognize them as motion; familiar examples are the motion of the *Mimosa pudica*, the Venus flytrap, the filaments of the *Berberis vulgaris*, and the like.

But with the aid of the microscope, we can come closer to the idea of plant movements; with it we see the protoplasm of the cell moving and the chlorophyll nuclei turning toward the light. But even in the most favorable cases, these are small selections out of the total movement of the plant organism. If we want to make visible the entire sequence of imperceptible motion, we must film the plants.

I can explain this by pointing to an example I saw in a quality color film showing the blossoming of a chrysanthemum bud. If we actually wanted to observe this eight-day course of events without interruption, we still could not have a view of the course of continuous motion. When we film the flower blossoming, however, then the course of events takes place before our eyes in a few minutes. Something stirs in the still-closed bud; it swells and swells as though filled with a strong inner drive. Now it breaks open and the first petals show themselves. They grow before our gaze, bend, and stretch, and already the blossom is resplendent in all its beauty. Of course, upon such a surprising sight, we should remember Brunner’s warning and avoid hasty anthropomorphisms. Nonetheless, the moving picture camera shows us indirectly that even this life of plants, seemingly so strange, exists and is driven from within; it shows us that plants, albeit with another degree of motion, are just as animated and spontaneous as our trusted animal world. That is just one example. What a plethora of possibilities is opened up here! If we recorded a sunflower, the image would show us the persistence and, if I may say so, the desire with which the flower turns toward the sun. If one cinematographically observed our sundew, *Drosera rotundifolia*, as it caught an insect, one would see with what power and energy the rosette prevents the wriggling insect from escaping, how the plant finally kills and digests it—insofar as the insect is digestible (i.e., soluble) to the plant—and then, when the day’s work is done, prepares itself for the next catch. We could observe the shoots of our grape vines as they move around, groping to find a supporting base. In the filmic image we could see the quick, living growth of some plants (for example, the way asparagus shoots up). And we could also observe wilting and dying as the transition from one movement into another.

By no means do we need to confine ourselves to the living world; certain events in the inorganic world are also ascertainable for the cinematograph. A particularly suitable object would be a crystal formation. We could see clearly the growth of a crystal in its

mother lye. One can obtain truly fine specimens by submerging a small alum crystal on a string into the alum solution; on film, this process of crystallization would become visible as a sequence of motion. The crystal, the individual of the inorganic world, would appear as if alive.

The cinematograph can provide a means for expanding our sensory experience, performing similar functions to those of the telescope and the microscope. The foundations of all natural science could become increasingly clear and visible in the more explicit, improved, and magnified views provided by the moving picture camera. With expanded senses, we will recognize motion in places where the naked eye cannot see it and come to understand more and more natural processes. (A new society founded in Berlin has established as its mission the task of employing the cinematograph for science. Only their achievements will reveal whether they intend to fulfill the wishes expressed here.)

## Notes

1. Henri Bergson, *Creative Evolution*, trans. Arthur Mitchell (New York: Camelot, 1911), 306.
2. On the Urania, see the following text by Franz Goerke (no. 34).
3. Bäumler here invokes the aphorism *panta rhei*, which is commonly attributed to Heraclitus.
4. “Allgemeingültigkeit und Notwendigkeit” comes from Kant’s introduction to the *Critique of Judgment* (1790).
5. Brunner was the pseudonym of German-Jewish philosopher, writer, and literary critic Arjeh Yehuda Wertheimer (1862–1937). The work mentioned by Bäumler was published in 1908.
6. Bäumler here quotes from Brunner, *Die Lehre von den Geistigen und vom Volke* (Berlin: Karl Schnabel Verlag, 1908), 228: “Veränderung des Nebeneinander, das Zustandekommen eines anderen Nebeneinander.”