The River Lech—a Cyborg

Jens Soentgen

Preview

What is a river? Wikipedia describes a river as "a natural, linear body of water that flows over land surfaces." This definition, however, is only an external and geometric definition; I would like to present an alternative. My suggestion would be that a river is rather a collective. Initially, it is a collection of water droplets that either fall from the sky or flow through the countryside. What these water droplets wish to achieve, which is namely flowing in the direction of the sea, is best accomplished in a large union with other water droplets. Every water droplet is therefore a magnet for other water droplets. Although they are individuals in the air, these water droplets become streams, brooks, and rivers. Water wants to swiftly move downwards. On the way down, water clings to grains of sand, stems, and pebbles. However, the ground holds the water tight, draws it in, and prevents it from flowing away. The quickest way for water to move downhill is when it glides on, in, and through other waters. In some aspects, water is its own lubricant thus creates its own propulsion: water pushes itself forward. Once these droplets are together, they prosper from a considerable force that is able to shape, tear, and build the landscape into whatever it wants. The river is a self-organized force of nature.

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River Phenomenology

What is a river? Wikipedia describes a river as "a natural, linear body of water that flows over land surfaces." This definition, however, is only an external and geometric definition; I would like to present an alternative. My suggestion would be that a river is rather a collective.[2] Initially, it is a collection of water droplets that either fall from the sky or flow through the countryside. What these water droplets wish to achieve, which is namely flowing in the direction of the sea, is best accomplished in a large union with other water droplets. Every water droplet is therefore a magnet for other water droplets. Although they are individuals in the air, these water droplets become streams, brooks, and rivers. Water wants to swiftly move downwards. On the way down, water clings to grains of sand, stems, and pebbles. However, the ground holds the water tight, draws it in, and prevents it from flowing away. The quickest way for water to move downhill is when it glides on, in, and through other waters. In some aspects, water is its own lubricant thus creates its own propulsion: water pushes itself forward.[3] Once these droplets are together, they prosper from a considerable force that is able to shape, tear, and build the landscape into whatever it wants. The river is a self-organized force of nature.

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[1] An earlier, shorter version of this paper appeared in German in Marita Krauss, Stefan Lindl, and Jens Soentgen, *Der gezähmte Lech. Fluss der Extreme* (München: Volk Verlag, 2014), 151-160. For critical comments I would like to thank the participants of the conference, "A Conception of Nature for the 21st Century in Augsburg" (June 2014), especially Uwe Voigt, Peter Gratton and Sean McGrath. I also would like to thank Marita Krauss for helpful comments on an earlier version of this paper, and Cassandra Marie Ballert and Julia Fendt for substantial help with the translation of this paper. The author may be contacted at: soentgen@wzu.uni-augsburg.de.

[2] Bruno Latour uses the term "collective" to represent a political-utopian concept; the term here is intended to be descriptive, namely as a unification of that which was previously separated. For Latour's concept, see: Bruno Latour, *The Politics of Nature. How to Bring the Sciences into Democracy* (Cambridge: Harvard University Press, 2004).

[3] For the physical conditions of rivers' potentials, see: Henning Kaufmann, *Rhythmische Phänomene der Erdoberfläche* (Braunschweig: Vieweg und Teubner, 1929), 74-85.

Regarding rivers in classical literature, one can find this apt quote that Martin Ninck had discovered from Artemidorus. The Greek dream interpreter wrote: "Rivers mostly resemble rulers and judges, because they do what seems good to them and without need to justify themselves, but rather due to their own discretion."[4] On ancient coins, river deities can be found occasionally pictured with Taurus, symbolizing the strength and fertility of rivers.[5]

Rivers are formidable forces of nature, although except for the occasion of flooding, they are not uncontrollable like a wildfire or storm. Their power mostly remains between the banks. Hence, rivers do not disperse and dissipate, but rather collect: plants, animals, and people. With its rushing rapids, the river is audible from far away; its sound is alluring. Birds populate the river banks, animals come, and naturally people as well. Many older cities are built along rivers or where rivers empty into lakes and oceans. Countries are also populated along rivers: rivers arrange space and make distances easy to reach. "Already with my few travels throughout the world," wrote Johann Wolfgang von Goethe, "I noticed how meaningful it is, when traveling, to inquire about the course of water and to ask where the flow is with every brook. One obtains an overview of every river region. …They are an aid to examine and memorize the geological and political tangle of countries."[6]

The river can offer direction and guidance and open paths and horizons because it often connects distant landscapes. At the same time, rivers are constantly active, incessantly they bring something new and novel while also carrying the old away. A river flows and pulls on everything around it, it sticks itself here and there, it attaches itself to this and that, wood, grass, seeds and other creatures float on top of it, as well as the colorful community of pebbles roll and hop underneath it. A river takes with it a floating world, within it swim waterfowl, beavers, and fish. Flowing like the river and coursing through it are the accumulations on its shores, which the river is continuously designing, shaping, and clearing.

For this reason, one will find a comparable abundance of both human and organic objects on the river banks. Rivers form microtropes, small inlets, or cut-off lakes, which can become habitats for delicate creatures. Rivers build paratropes, adjoining areas, which are neither fixed

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[4] Artemidor, on. II 27, quoted by Martin Ninck, *Die Bedeutung des Wassers im Kult und Leben der Alten. Eine symbolgeschichtliche Untersuchung* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1967), 22.

[5] See Reinhard Falter, *Salus Provinciarum. Eine Sammlung von Flussgottdarstellungen auf Münzen des Römischen Ostens.* Schriften des Instituts für Naturphilosophische Praxis Nr. 3 (München 2009), VIII-XII.

[6] Johann Wolfgang Goethe, *Aus meinem Leben. Dichtung und Wahrheit,* in *Sämtliche Werke*, I. Abteilung, Bd. 14 (Frankfurt a.M.: Dt.-Klassiker-Verlag, 1986), 455. For the meaning of rivers as traffic routes for the indigenous people in the America, see Georg Friederici, *Die Schifffahrt der Indianer* (Kassel: Hamecher, 1975), 92-96.

nor flowing. Rivers also create spheres, which for their part, attract creatures and become wedding halls and cradles and graves. From monotonous surfaces, rivers can also shape landscapes that both clang and sing and that are richly structured on an indefinite variety of scales.

Why Do Rivers Flow?

Why do rivers even exist? This type of congregation of water is something very peculiar and it cannot be simply be explained by gravity. Water does not simply gather when it is falling, when it is being brought down by gravity. When it rains heavily, we say that it is a torrential downpour (German: *es regnet Sturzbäche*). When water falls through the air, rivers are *not* being formed, not even a small stream if one looks at it. Instead, sooner or later, water dissolves into a cloud of finer and finer droplets. Falling water eventually dissolves, but it never accumulates. Thus, when you let gravity alone act on water, the result is rain or even spray, but not creeks, brooks or rivers.

So far we have concluded that gravity alone is not adequate enough to describe the phenomenon of rivers. Creeks and brooks only begin to develop when water is moving on top of ground surfaces. But why does water not drain off into the widest front possible, but instead concentrating itself? Why does it form creeks and brooks at the slightest opportunity?

"Why do rivers even flow?" asked the user *Murrily* in the online forum *Good Question.* Arminio, another online user, responded to Murrily's question and wrote, "Wow, this is terrifying… what's next, how often does the earth revolve around the sun each year? Here's my answer: It rains on top of a mountain and then it runs down."

This is what many think. However, this only explains why rainwater from the mountains ultimately ends up in the sea. Though, this water does not necessarily need to collect in rivers. There are other forces that have an obvious effect on water, otherwise there would not be rivers, including all other varieties of flowing water, from multiple, braided channels of untamed streams to the meandering river.

I already stated my assumption previously: water minimizes friction by joining together and carrying these obstacles away. Every water droplet that runs across a surface and adheres to it is delayed in reaching the bottom. When water merges to form brooks, streams, and rivers, to a certain extent, the water shortens its path by both propelling and sliding on top of it/within itself. For example, one can observe this phenomenon when riding in a train through the rain. On the window panes, the individual water drops slowly gather and develop into swiftly flowing streams that are much faster than the individual droplets.

Another common phenomenon can also illustrate this. I call it the empty bottle paradox. It is the simple observation, that in every water

bottle that has recently been finished, one can find enough water for another sip one or two minutes after setting the bottle back down. This will happen even if the bottle was completely 'emptied.' This remaining sip does not just appear from nowhere, it was already in the water bottle, but just did not come out. Isolated water droplets hung on the rim of the bottle and remained fixed. However, when one sets this seemingly empty bottle back on the table and gives the droplets enough time to gather on the bottom, then they succeed in doing what was impossible for the individual droplets to do: to come out of the bottle. This example reduces the river phenomenon into its simplest form.

In one sentence, one can say that rivers are the methods that water uses to escape out of the landscape to the sea. To some extent, once they have come into being, rivers remove water from the countryside with an infinite number of capillaries. Where the rivers are, water is able to move and overcome obstacles. Rivers are movers.

When it is part of the river, water can creatively overcome the obstacles and barriers that the earth tries to put in water's path towards the sea. The geographer, Henning Kaufmann, in a groundbreaking natural-philosophical investigation determined that water's self-organizing[7] phenomena are able to form spontaneously, when apt conditions are given. In his concept, rivers are not merely a linear consequence of gravity.

While lakes are another type of collective of water droplets that simply accumulates in preformed basins, rivers are actively creating their own shores. As a result, rivers are quite persistent: one cannot get a meandering river to overcome its tendencies (to meander) with methods of river control. It will continue to form meanders.

The flow process must be understood in its entirety because a river is internally connected. This is indicated by the fact that an intervention at specific location, such as a river bend, does not only affect the river downstream. It also affects the river upstream. Acknowledging this, Kaufmann wrote, "The course of a river is…a structure of interconnected events and 'moments,' that are both simultaneous and mutual and, in a sense, directionless, which 'bear the whole.'"[8] In a certain way, the river-process is causally not only directed upside down. It has also an downside up direction. Changes upstream can cause changes downstream, but the same is true in the other direction. The river is a whole.

To some extent, as rivers flow, they can create the circumstances for further and faster movement; for instance, they form a bed. A river bed has many similarities with a street or a path where people and animals move, indeed, it has the same function. A collective of people that moves uncoordinated downhill will be much slower than if this same collective

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[7] Kaufmann speaks of self-differentiation in his natural-philosophical investigation, cf. Kaufmann, *Rhythmische Phänomene*, 1.

[8] Kaufmann, *Rhythmische Phänomene*, 319, footnote 1.

moves coordinated on a street. Rivers, too, move faster in their self-created beds.

To a certain degree, rivers are very robust when faced with changes. Rivers continue to flow even when their path is changed or when the surrounding landscape is altered. These characteristics are the conditions which allow humans to use rivers in multiple ways.

This is the reason why rivers are able to reach an incredibly old age. Even if it sounds like a paradox: there are rivers that are older than the mountains from which they spring. The Taoist saying, that the soft can conquer the hard, that water will prevail over stone, is certainly verifiable here. The Amazon River is older than the Andes;[9] the river originally emptied into the Pacific Ocean, which can be proven with the means of Biogeography: there are descendants of sea-species (sharks) in the upper Amazon, not in the lower Amazon. Rivers often bear very old names, i.e. names that belong to old languages. Within one given language, the river names are usually the oldest stratum (Lech for example is a celtic name). Another fact that shows, that generally they are very old entities.[10]

The ability that rivers have to organize their flow and to continuously build river beds does not necessarily mean that rivers are invulnerable. If the landscape, which is also a member of the river community, undergoes monumental changes, then the rivers are also altered and, in the most extreme case, disappear. Although rivers distance themselves from the landscape, they remain deeply connected with it through the long river banks.[11]

If the catchment area of rivers is deforested, then there are also unforeseen consequences for the rivers. Forests namely delay and elongate

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[9] Sepp Friedhuber (Ed.), *Uramazonas. Fluss aus der Sahara* (Graz: Akad. Dr.- und Ver.-Anst., 2006), 36, 58.

[10] Gottfried Wilhelm Leibniz, *Neue Abhandlungen über den menschlichen Verstand, Teil II* (Frankfurt a. M.: Insel-Verlag, 1996), 31: "By the way, I say that the names of the rivers, which usually descend from the earliest known times, best describe the old language and the old residents, which is why they would have value to a special examination."

[11] It is not only by mere chance that Quine, the father of analytical philosophy, uses riverbanks as an example in his famous work, *Word and Object*, in the section on "Vagueness." Possibly inspired by the Austrian geographer Albrecht Penck (*Morphologie der Erdoberfläche*, Part 1, Stuttgart: Engelhorn, 1894, 82f.), who formulated an analogous problem fifty years earlier, Quine noted that it is almost impossible to determine the length of a riverbank. "We might double the length by trebling our attention to minutiae." Willard van Orman Quine, *Word and Object* (Cambridge, MA: MIT Press, 1960), 128. For more about the banks of rivers (in comparison to lakes), see August Thienemann, *Die Binnengewässer in Natur und Kultur. Eine Einführung in die theoretische und angewandte Limnologie* (Berlin: Springer,1955), 20-30. For these reasons, the limnologist August Thienemann describes the lake as a closed body of water and the river as an open body of water. See Thienemann, *Binnengewässer*, 22.

the downward travel of the water droplets and ensure that the river that flows through the woodlands has a relatively constant flow even when it barely rains. They have a buffering function. Forests can be an interim storage area for large masses of water that fall from the sky for just a few minutes and transform into a structured oozing and seeping basin. When life emerges, it restructures the flow of water, as it restructures also other substance-flows. It cultivates the flow (and the composition) of water in order to make it more suitable for the needs of living beings. Living water is less aggressive than physical water. Therefore, if forests were cut down, then the type of collective of water changes. In a landscape, that has been altered in this way, in a deforested landscape, the well organized, buffered river no longer will be found. Rather, it would become a chaotic, sudden and turbulent outpour/downpour of water, such as what often happens in southern Europe, as well as other places, due to large-scale deforestation.[12] Large river construction projects, which transform the river bed, change the river fundamentally, even if it does not lead to such drastic consequences such as drying up. A typical example of this is the he Lech River, a tributary that flows into the Danube. The Lech River springs in the Lechtaler Alps and then flows as a more or less unbounded river through the Tiroler Lechtal Valley in Austria. By the time the Lech River enters Bavaria though Füssen, its path on the German side becomes highly regulated in such a way that the Lech River is no longer a self-organizing collective of water droplets. Instead, it is a remote-controlled cyborg. The Lech River is a great example of the modern river.

A Modern River: The Lech

In and around Augsburg, one can notice the Lech River by peering down from bridges. The Lech River is surrounded by steep, inaccessible dams, like something which we better not to get too close to. Only beaten paths lead to and around these dams. These paths go past no-trespassing signs that nature conservation authorities put in place and to urge individuals to take care of that which the public had already sentenced to distinction decades ago. There are not any low-threshold entrances to the Lech River by beaches, which would have been present with natural rivers. The Lech River flows solitarily and alone through Augsburg like a displaced body of water. There are also no signs of rafts or logs in this river; it is not recommended to use the Lech River for transportation because it is interspersed with dikes and swells. The narrowly-guided and dammed river burrows deeper and deeper, here and there reaching 10 meters, as if it wanted to disappear. This old river, which was a hospitable assembler,

[12] For rivers that are no longer navigable in Sicily and Greece, see A. Dieck, *Die naturwidrige Wasserwirthschaft der Neuzeit, Ihre Gefahren und Nachtheile gesammelt* (Wiesbaden: Limbarth, 1879), 112.

appears to have become unsociable. In this man-made, artificial canyon, the Lech River lost contact with those that first settled the area because of it.

There are no fishermen now, only a few fishers that just catch the self-exposed fish. There are not any loggers either. With exception of the hydraulic engineers and the power plant operators, there is not any other profession that works directly with the river. There are hardly any river fish in the Lech River as well, even the pebbles have disappeared. Why has this happened?

In 1984, a dam was completed near Merching, which is not too far from Augsburg, that completed a huge water construction system from Füssen near the Alps up to Augsburg. Because of that, the Lech River is no longer a river. Instead, it has become something new: a hybrid of a natural body of water and a mechanical system that extends for several kilometers. The Lech River does no longer organize its own flow, but rather its flow is determined at a distance and for economic reasons.

Between Forggensee and Augsburg, which is more than 100 kilometers long, the Lech River is not a "river with hydroelectric power plants in it," but is rather a single, specialized hydroelectric plant that's goal is to generate high-priced peak current electricity,[13] which is predominantly operated by E.On Energy AG (between Füssen and Augsburg) and Lechwerke AG (from Augsburg and the Danube River). It is a river connected to the electricity market, a remote-controlled Cyborg. The river's behavior and ecology are increasingly determined from the European Energy Exchange (EEX) in Leipzig and other organizations and institutions instead of the precipitation in the Alps, which supplies the Lech River's water.

The term 'cyborg' normally appears in science fiction and is generally defined as a hybrid of humans and robots. From Science Studies and her many, influential publications, Donna Haraway referred to such cyborgs as already being on the move [14]—like a transgenic plant that contains technically modified genes, or specifically bred mice, like the OncoMouse®. However with rivers, this concept has not been applied; although in perhaps the most famous river study, presented by US-American historian Richard White, is the analysis of the history of the

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[13] The expansion of the Lech River is well documented in Bernhard Raster, *Nutzung und anthropogene Veränderungen des Lechs in historischer Zei*t (Univ.-Diss., unpublished Würzburg 1979), 210-256. Raster proved that the BAWAG (Bayerische Wasserkraftwerke AG) did not consider flood protection (210).

[14] Donna Haraway, *Simians, Cyborgs, and Women. The Reinvention of Nature* (London: Free Ass. Books, 1991), 1. Haraway defines a cyborg as "a hybrid creature, composed of organism and machine." She says that cyborgs are "post-Second World War hybrid entities" (1).

Columbia River with the similar term of the "organic machine."[15] A cyborg, a 'cybernetic organism,' is a hybrid creature from natural and technical components.

The metamorphosis of the Lech River into a cyborg is not a singular, spectacular occurrence that would have only taken place in the Bavarian-Swabian region. Contrarily, there were many parallel constructions in the 20th and 21st centuries throughout the world. Patrick McCully, the previous director of the International Rivers Network, wrote about this international development of river ways in his book, *Silenced Rivers: The Ecology and Politics of Large Dams.*[16] In it, he indicates that in 1950, approximately 5000 dams existed worldwide that were over fifteen meters high and near the end of the 20th century, the worldwide number grew to over 40,000. China has the greatest number of dams with approximately 22,000, well over half of the dams worldwide, greatly exceeding the United States, which has nearly 6,000 dams and India, which has around 4,300. Within Europe, Spain constructed the most dams, around 1,200, followed by Turkey with 600, and then France, which has fewer than 600 dams. Germany has 311 dams in this magnitude and is at 17th worldwide, between Norway and Albania. Although there was a noticeable expansion of dam projects in the 20th century, McCully also recorded a deceleration of dam constructions beginning in the 1990s.

Already at the beginning of this development, Martin Heidegger examined the networked nature of modern technology in one of his most famous techno-philosophical papers. In it, he philosophically analyzed a hydro-electric power plant, which happened to be the power plant in Rheinfelden. Heidegger uses the term *Gestell*, which means either *enframing* or *setting*, to describe what happens with the river.[17] He references the German word *stellen,* which means to *set* or to *put*, to convey the similar meaning of being apprehended by the police. With reference to the Rhine River and the power plant, Heidegger uses a similar

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[15] Cf. Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill and Wang, 1995).

[16] Patrick McCully, *Silenced Rivers. The Ecology and Politics of Large Dams* (London: Zed Books, 2001). Cf. also David Blackbourn, *The Conquest of Nature: Water, Landscape and the Making of Modern Germany* (London: Norton 2006), and Franz Krause, *Flüsse, Dämme und das Beispiel des Kemijoki in Lappland*, in *Der gezähmte Lech. Fluss der Extreme,* ed. Marita Krauss, Stefan Lindl and Jens Soentgen (München: Volk Verlag, 2014), 161-170. See also Franz Krause, *Shaping and Reshaping the Kemi River. Notes on the Perpetual Genesis of the Major Catchment Basin in Finnish Lapland*, in Mark Nuttall, Hannah Strauß, Kaarina Tervo-Kankare, eds., *Society, Environment and Place in Northern Regions* (Oulu: University of Oulu 2011), 27-45, and Franz Krause, *River management. Technological challenge or conceptual illusion? Salmon weirs and hydroelectric dams on the Kemi River in Northern Finland*, in Michael Schmidt, Vincent Onyango, Dmytro Palekhov, eds., *Implementing Environmental and Resource Management* (Berlin: Springer, 2011), 229-248.

[17] Martin Heidegger, *The Question Concerning Technology* (New York: Garland Publishing Inc., 1977).

phrase, "The hydroelectric plant is set in the current of the Rhine. It sets the Rhine to providing its hydraulic pressure."[18] He continues to write boldly, but also convincingly, "The hydroelectric plant is not built into the current of the Rhine River as is a wooden bridge that has joined bank with bank for hundreds of years. Rather the river is dammed up to the power plant"[19] (*der Fluss ist verbaut in das Elektrizitätswerk*). So Heidegger diametrically reverses the convention; a river's characteristic are determined from the power plant: "What the river is now, namely, a water power supplier, derives from out of the essence of the power station."[20] The parallels with the Lech River are obvious and show that Heidegger's essay is not only a milestone in the philosophy of technology because it clarifies the expansive and systematic features of modern technology in a persuasive argument, but also because of its philosophical insights into the modern river. However, if Heidegger views the *setting* (*Gestell*) as *fate* (*Geschick*), which threatens human beings,[21] then the question arises as to whether an all too metaphysical river is being represented, and thus blurring the responsibility of specific people through the evocation of an all-encompassing and anonymous process. Instead, Heidegger says that the political resistance to specific technical projects does not play any roll, it cannot hinder the process. Thus he adopts if not a fatalistic, an at least adventalist attitude.[22] Heidegger's pupil Herbert Marcuse adapted and expanded this critique of technology and introduced them into mainstream critical theory.[23]

The transformation from a river into a cyborg, the process of being built into a power plant is not a metaphysical event happening to humankind or to man in singular, but it is rather the result of specific alliances of certain people, fighting against other people, winning against other people in a very specific historical position.[24] These people have poured their political victory over their opposing contemporaries in cement and from that, they have also made certain that the following generations will believe that the current condition of the landscape is natural, or at least, that it is best for the common good. On today's Lech

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[18] Martin Heidegger, *The Question Concerning Technology*, 16.

[19] Martin Heidegger, *The Question Concerning Technology*, 16.

[20] Martin Heidegger, *The Question Concerning Technology*, 16.

[21] Martin Heidegger, *The Question Concerning Technology*, 24.

[22] Martin Heidegger, *Die Technik und die Kehre* (Stuttgart: Klett-Cota, 1962), 41f.

[23] Herbert Marcuse, *One-Dimensional Man. Studies in the Ideology of Advanced Industrial Society* (Boston: Beacon Press 1966), S. 153-153-169. Jürgen Habermas referred to Marcuse and developed his own variant of critical theory from this starting point. See Jürgen Habermas, *Technik und Wissenschaft als Ideologie* (Frankfurt am Main: Suhrkamp, 1974).

[24] Hannah Arendt insisted likewise on the plurality of man, which is a prerequisite of politics. See her *Vita activa oder vom tätigen Leben* (Stuttgart: Kohlhammer 1960), 15 f. and passim.

River, just as many other similarly obstructed rivers, rather everything is power and politics, petrified politics.

The power plants that were built were supposed to provide the aircraft industry and its suppliers, amongst them aluminum and magnesium plants, with energy. The first hydroelectric power plant was constructed near the city Landsberg, which is situated on the Lech River, and was built by the concentration camp prisoners that were transported from Auschwitz. From the energy supplied by the power plants in 1944, expansive bunkers[25] were erected to house Hitler's "wonder weapon," the Me262 fighter jet, underground (the bunkers still exist as they are too massive to be detonated). Prisoners of concentration camps who had been carried in cattle cars from Auschwitz since June 1944 had to work there. Because of the heavy workload imposed on them by the SS, many were completely exhausted after only a few weeks whereupon they were sent back from Landsberg station to Auschwitz and killed in gas chambers. The construction sites near Kaufering and Landsberg were homicidal: prisoners called them 'cold crematories' and 14,500 people were murdered within 10 months.

The BAWAG used forced labor[26] to build six power stations both north and south of Landsberg. Only a few weeks after the beginning of construction, the later "attorney responsible for the landscape of the German Reich" ("*Reichslandschaftsanwalt*"), Alwin Seifert, gave his blessings, albeit both conditionally and regretfully, to use the power plant construction to transform the natural river between Schongau and Landsberg into an "economic landscape" and to lose "river landscape…of outstanding beauty."[27] Nevertheless he gave his approval of the project with the aspiration that the lost wild landscape is replaced by a new "cultural landscape with a different, but eventually equivalent beauty". In addition, he emphasized that, seen from Schongau and Landsberg, the "river will be preserved as river" and the "youth of the coming genera should at least have small pieces of undisturbed flowing water in their living space".[28]

In post-war Germany, electric power became even more important than during the time of National Socialist (Nazi) rule because, with its promise of robust economic activity, it compensated for both the political trauma and debts.[29] Between 1947 and 1984, the Lech River was completely reconstructed between Füssen and Augsburg. Firstly, the reservoir dam in Roßhaupten was built, where against a decree from the

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[25] Posset, "Deckname 'Ringeltaube,'" 18f.

[26] Raim, "Zwangsarbeit," 121.

[27] Stadtarchiv Landsberg NA 5193.

[28] Cf. Stadtarchiv Landsberg NA 5193, Architect Alwin Seifert to the internal affairs ministry, for the attention of undersecretary Arno Fischer, 8.4.1940, my trans.

[29] Cf. Werner Abelshauser, *Deutsche Wirtschaftsgeschichte seit 1945* (Bonn: Bundeszentrale für politische Bildung 2004), 11.

Bavarian ministry, the Ilas ravine was also flooded in order to obtain some additional meters of downhill gradient. The 'men of BAWAG' were very proud of their hydroelectric plant with a yearly output of "168 million kilowatt hours" and thus an equivalent of "100,000 tons of coal worth approximately 6.5 million DM (Deutsche Mark)."[30]

Generally, the reservoir in Roßhaupten was only seen as a starting point for BAWAG, as Hans Pfeuffer writes in accordance with BAWAG that a "full construction from Roßhaupten to Augsburg" was the goal. The 'men of BAWAG' stepped out to "put on a bridle of steel and concrete on the Lech that made it subservient."[31] Those men "did not sleep."[32] With a fully constructed Lech they were planning to reach an output of more than one billion kilowatt hours per year and that would be equivalent to "800,000 tons of coal, which would be in turn [in 1954] be worth 53 million DM."[33] This aim was almost fully accomplished.

BAWAG was advancing towards progress; Hans Pfeuffer supports them with tremendously dynamic words:

> Technology conquered the world in a unique revolution, changed the life of humanity, threw the stagecoach into the ditch und set the car on the road, threw birds of steel into the air and drilled into the deep with compressed air to dig up the black gold, voracious and insatiable, as coal became their food. But the steel-spitting progress became more and more insatiable, and new food, the electric energy, helped him to grow colossally and to become a Goliath who stands straddle-legged above our existence. Technology needed electricity. The larger and more gigantic the spider web of wires became that covered the earth…the more enormous the turbines became that produced the energy needed for our technological age.[34]

This sounds very close to Heidegger, whose lessons on the *Gestell* (setting) describe the same process in a more critical, less enthusiastic way. In order to fulfill its futuristic mission, BAWAG insured themselves against the renitent population (Hans Pfeuffer: "It was a hard fight."[35]) with close contacts to the government—as eg. Dr. August Geishöringer, who was minister of internal affairs in the 2nd cabinet Hoegner from December 14, 1954 until October 8, 1957 and at the same time, from

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[30] Hans Pfeuffer, "Dämme—Stollen und Turbinen. Der Lech im Dienste des technischen Fortschritts," *Fürstenfeldbrucker Tagblatt*, 9.10.1954. 13, my trans.
[31] Pfeuffer, "Dämme," 13, my trans.
[32] Pfeuffer, "Dämme," 13, my trans.
[33] Pfeuffer, "Dämme," 13, my trans.
[34] Pfeuffer, "Dämme," 13, my trans.
[35] Pfeuffer, "Dämme," 13, my trans.

1955-1958, supervisory board member of BAWAG and closely linked to water management.[36] When in the course of the negotiations about the "Litzauer Schleife" the council of ministers planned an on-site visit, BAWAG escorted this important expedition with ten leading engineers. Dr. Wolfgang Engelhardt, chief manager of the German Association for the Protection of the Environment (Deutscher Naturschutzring) requested that their association would also be allowed to send more than the two guaranteed delegates. Prime Minister Dr. Wilhelm Hoegner (SPD) replied that he had to talk to Geislhöringer first. Subsequently the balance of power between water management and preservation of nature was maintained with ten to two delegates. [37]

Thus BAWAG finally won against an active 'counter-force', the "emergency association upper Lech". BAWAG ignored protests ranging from large associations for the protection of the environment, from 2000 teachers[38] to appeals from "a considerable amount of scientific associations, entitled fishermen and the vanguards of canoeing."[39] This vehement, although virtually ineffective, opposition which was led by Otto Krauss, the director of the Bavarian Office for Conservation between 1949 and 1967.[40] With help from massive protests, only a few kilometers of the river were saved, namely the originally planned 'Dam 5,' which was transformed into a nature reserve now known as the 'Litzauer Schleife.'

The Romans used the term "Rivalis" to describe a neighbour, who uses the water of a canal or brook. It is from this word, with a slight shift in meaning, that the word 'rivalry' is derived. The single, most powerful rival, the electricity industry, has encroached upon the shores of the Lech River all the way from Füssen to Augsburg and has displaced everything else: the loggers, the fishermen, the boat drivers, the children on the river banks, and even the river fish and pebbles. The versatile use of the natural landscape, be it either a forest or a river, ensures an inherent diversity. As the alternative uses of the Lech River are suppressed, so is its internal diversity. Within the last fifty years of the past century, the water from the Lech River has probably generated profits that have amounted to several billion euros.

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[36] BAWAG, *50 Jahre* BAWAG 1940-1990 (München 1990), 6.

[37] Bierling, Gustl, "Am Lech-Stau schwillt vorerst nur der Aerger. Unfreundliches Echo auf Regierungsentscheid bei Naturschutz und Bawag," *Münchner Merkur*, 29.11.1955, Nr. 285, 6.

[38] Gustl Bierling, "Verzweifeltes Ringen um die letzte Lech-Bastion. Verzicht auf eine einzige Staustufe könnte unersetzliches Naturdenkmal retten," *Münchner Merkur*, 27. Oktober 1955, 6.

[39] Otto Kraus, *Zerstörung der Natur – unser Schicksal von morgen? (*Nürnberg: Glock und Lutz. 1966), 206f.

[40] Kraus, *Zerstörung der Natur*, 206f.

The "Stairs of a Power Plant:" A River That Operators Wish For

In 1994, the BAWAG, which belonged to the Bavarian state, was privatized and taken over by VIAG, which was then handed off to E.on in 2000. Today, E.on Wasserkraft GmbH continues to carry on BAWAG's legacy. In many publications from E.on Wasserkraft GmbH and in a small museum about the Lech River on the Roßhaupten Dam, the Lech River is portrayed as the "stairs of a power plant." (Kraftwerkstreppe)[41] Here, the river is linearized to account for the relative size of the maps.[42] This 'stair' depiction is a longitudinal section through the course of the river in which the x-axis shows the length of the river in kilometers and the y-axis illustrates the height of the river above sea level. In this depiction, there are 25 dams between Füssen and Augsburg, although not all of them have been implemented, and are shown as steps in the steep profile of the terrain. As the illustration moves from left to right, it also approaches zero; the "gross head" is 297 meters. The Lech River is reduced to simply being "falling water."

The diagram simplifies reality, which then became adjusted to the diagram. The river has been transformed into falling water. First, with longitudinal installations, the river was narrowed to between a quarter and a tenth of its surface area. This isolated the Lech River and cut it off from its accompanying floodplains. The shoreline, which was previously ridged and fractal with creeks and tributaries, was then geometrically straightened. The close contact that any river maintains with its surrounding landscape was drastically reduced.

And then one constructs additional barriers and power plants. However, to get these to work properly, the river water needs to be strained: driftwood, pebbles, and fish are strained out with great rakes or dredged from the dam reservoirs. What is performed in the natural sciences as a conceptual or experimental operation—that would isolate and geometrize a phenomenon—has transformed the Lech River into a new nature.

Each surge of the water from the Lech River that flows unbounded and free from the hilly and glacier-formed landscape of the Alp foothills flows between Füssen and Augsburg through 20 power stations and 20 turbines before it reaches Augsburg. In Augsburg, four more power stations await the water from the Lech River and seven more are on the

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[41] Bayerisches Landesamt für Wasserwirtschaft, *100 Jahre Wasserbau am Lech zwischen Landsberg und Augsburg. Auswirkungen auf Fluß und Landschaft.* Schriftenreihe Bayerisches Landesamt für Wasserwirtschaft, Nr. 19 (München 1984), 60. Also see: E.on Wasserkraft GmbH, Unternehmenskommunikation, *Gewaltige Kräfte am Lech. Regenerative Energie aus Wasserkraft* (München 2008), 10f.

[42] Henning Kaufmann, *Rhythmische Phänomene*, 155.

river's path to the Danube, which are controlled by other operators. In the jargon of the power plant operators, the Lech River is known as "fuel."[43]

Water flow and cash flow are from now on linked together. When little money flows for electricity, i.e., when the price for it is low, then the river also does not flow. This happens in the following way: if a lot of power is being supplied to the electricity grid, but there is little demand, then, with a single mouse click from the central control room in Landshut, the power plant operator closes the Forggensee locks; the lake swells. However, when the price of electricity increases, the power plant operator will continue to allow the turbines to run. Each surge of the Lech River must go through twenty separate turbines before it reaches the last dam in Merching. Everywhere, the lively force of the Lech River is extracted, fed into power lines, and sold to the energy market. The autonomous periodicity of the Lech River is superimposed onto a man-made periodicity.

From the perspective of climate-friendly power generation, the Lech River is excellently optimized, thanks to the work of BAWAG and now E.on Wasserkraft GmbH. The Lech River has 'originally' the ability to flow with the same force both night and day, and Sunday is no different than Monday. If the river's force does change, it is because of the weather and not because it is Sunday or Monday. However, society uses less energy during the night than during the day. Production is at a halt on Sundays, whereas work begins again on Mondays and with it, energy consumption quickly increases. Additionally, the Lech River has considerably less water during the winter months, when much power is needed, for example, when additional lighting is required for the darker winter months. The snow-melt and thaw during spring and summer months, on the other hand, feed the Lech River. There is little harmony between what we want and that what the river does. Therefore, clever engineers have taught the river to flow when it makes the most economic sense from the perspective of the company that controls the river. So now the river flows when power is needed and it has Sundays off, just like any other normal employee. The Lech River's water is retained at the main reservoir Roßhaupten, now known as Forggensee,[44] and is allowed to have a break because additional electricity is not needed on Sundays and could only be purchased at unfavorable prices. However, on Mondays, the normal work week starts again. The power prices on the electricity market begin to climb once again and the Lech, which was merely rippling in its reservoir, is awakened and sent to work. Already at the crack of dawn, the silent gorge at Roßhaupten starts to rumble and foam as the locks are opened and the water from the Lech River begins to make its way down

[43] It is also called "work materials" (*Betriebsstoff*). Pfeuffer, "Dämme," 12.

[44] From the secret desire of the BAWAG employees, Forggensee should have been christened as the "BAWAG-Lake" instead, cf. Pfeuffer, "Dämme," 13.

the stairs of the power plant from Forggensee to Merching. There is another reservoir that was constructed near Merching to receive the great swells of descending water and even out the fluctuations in the water level, therefore allowing the Lech River to flow in a relatively uniform and constant stream towards Augsburg. The Lech River has become adapted to our society so that now he is one of us. Just as any other hard working person starts working on Monday and begins their weekend on Friday afternoon, so does the Lech River. The river is obviously successfully socialized. Only sometimes, in the case of a flood, the Lech River will do what it wants and not what it should.

The control room of E.on Wasserkraft GmbH, which was constructed in 2009, is located in Landshut nearby the Isar River. From here, two independent data lines monitor, evaluate, and control some bavarian rivers every second. There is a "river master" who sits in front of a panoramic projection of the geometricized rivers. He runs the Lech River today, tomorrow the Isar River, and then possibly the Main, Amper, or the Altmühl Rivers two days from now, because these rivers are also "operated" (*gefahren*) from Landshut. The Lech River actually has a regular timetable that dictates how much water should flow when, where, and for how long. The main features of this schedule are determined for years and are used to base contracts with the electricity collectors. It is with our cyborg that everything is in perfect order, the river is one of us, working with a fixed schedule from Monday to Friday, even having a few holidays; however, retirement happens only for the time being. The water engineers in Landshut believe that the Lech River should continue to flow forever as it does now. Although one can imagine that with such strict regimen and continuous discipline without freedom cannot go on without consequences. The typical river fish have disappeared and now the river has a different chemistry. The pebbles are gone, and with that, the river's element of life, which in consequence forces it to continue to deepen.

Additionally, the river's outer skin, its floodplains, have either largely disappeared or have become narrower to make room for a commercial forest, agriculture, or simply because they have dried up. The colorful spring flowers of the swampy forests do not bloom anymore near the Lech River; its jewelry has vanished. The area's body has changed, its water is no longer milky as we expect it with a river coming from a glacier, the river now has a greenish tinge. The Lech River of today is an example of a diligent worker that contributed to Bavaria's recovery after the Second World War and has provided us with climate-friendly electricity. Thanks to the perfection of the system that was installed in the Lech River, it can now make a contribution to the trains running in Bavaria, factories operating, and the power that is supplied to households. We have made the Lech River give up its wildness. The river is no longer itself, but rather one of us. It is a colossal fellow that is completely utilized down to the smallest wave. And one that helps out day after day to

increase the gross domestic product. Walled in between dams and held up in reservoirs, it is occasionally a sad sight to see the Lech River.

It is well known, that frontiers of the states are not only the results of geographical structures, but as well results of politics, of wars and of peace-treaties. Likewise, the inner structure of the countries is not only the product of geological and ecological constants, that are here and there modelled by anthropogenic influences. The example of the river Lech shows, that this landscape—like many river-landscapes around the world—can only be interpreted as a result of a fierce social conflict. We do not find any neutral 'anthropogenic influences', but we may rediscover this landscape as being the result of the nearly total victory of a well organized, powerful group of water-engineers over a heterogenous, badly organized group of teachers, early environmentalists, nature-lovers and others. It is not a story of "man dominating nature", but it is a story of some people realizing their model of nature, inasmuch as they succeed in overcoming the resistance of opposing groups, who have a different concept of their nature. The success, the victory of the water-engineers has been made durable, nearly irremovable with millions of tons of concrete, that nowadays dominate the sight at the margins of the Lech.

The Lech is interesting, as on the German side, we see one political concept being realized very radically, at the expense of opposing concepts. The Bavarian Lech is reduced to a mega-machine, to a cyborg. On the Austrian side, we find the contrarian structure—a mostly free-floating river without energy plants. Also this Lech is not the result of geography, but of politics. And because politics change faster than geography, either the one, either the other River Lech will be subject to future changes.