CHAPTER 3
A Holistic Understanding of Water and Rivers

> *"Naturally-moving water multiplies itself. It raises its own quality and wells up autonomously. It changes its freezing and boiling points. Wise nature makes use of this phenomenon to raise water to the highest mountain peaks without pumps..."*[1]
>
> Viktor Schauberger

Water has been a never-ending source of wonder and inquiry for decades of my life. It started with flow-forms and the work of John Wilkes, when I studied at Emerson College in 1982-83. It continued with the work of Rudolf Hauschka and the understanding of how water renders possible potentizing of homeopathic medicines. It picked up pace with the work of Theodor Schwenk and son Wolfram, and of Masaru Emoto, … . It found practical applications that I explored in the work of Johan Grander, or Clayton Nolte and devices I could use in the house to improve water quality. In between it led me to the work of Viktor Schauberger, who has rightly been called the "water wizard."

We can approach an understanding of water from a multitude of aspects, but one of them stands out among the others for its simplicity and for the richness of insights it can provide for the rest of our explorations. It will contribute to "raising our thinking up an octave" in immediately practical ways.

The Vortex: A Unique Phenomenon

Imagine a vortex like you may have seen in countless images of water circling toward a center, or of galaxies delineating a center point. Here we have the counterpart to centrifugal forces, which are easily comprehensible from our immediate environment. Take a clothes washer or any compression engine. They all use centrifugal forces. A combustion engine operates with tremendous forces at the center, which then move to the periphery. Energy is dissipated from a center outwards. In the vortex we have the polar opposite to this phenomenon, the natural complement; forces converge from the periphery inward. The movement of the vortex mirrors that of the planetary system with the Sun at its center. The speed of movement in this case accelerates towards the center. And planets circle faster the closer they are to the Sun, such as Venus of Mercury, slower the farthest away, such as Saturn or Pluto.

Water that drains naturally displays the galaxy-like configuration of the vortex, anti-clockwise in northern hemisphere, clockwise in the southern.

[1] Viktor Schauberger, Callum Coats editor, *Nature as Teacher*, 108.

Looking up closer we will notice that the whole system sways and moves. A vortex has a natural pulsation; it shrinks or expands in diameter, with corresponding extension and contraction of its length, all of this happening in a periodic manner.

Let us look closely at a vortex generated in a cylindrical glass vessel. At the edge of the vessel we have a very slow rotation; moving in the speed increases dramatically. At the center and at the tip of the vortex the speed is virtually infinite. In physics the phenomenon is described by the equation r x v = c, with r being the radius, the distance of the surface of water from the center of the vortex, c is a constant number and v the speed of rotation (e. g., cycles per minute). From this equation we see that when r = 0 then v = ∞. At the tip of the vortex the tendency toward infinite speed is only countered by friction. Since this speed cannot occur in the physical world, what happens is that water begins to dissociate into vapor, releasing electrical charge.

When we investigate pressure in a vortex we find something similar to the velocity. When r = 0, then p = ∞. In physics this means a pressure lower than a vacuum. We have here described the polar opposite of a combustion engine at whose center occurs an explosion radiating outwards. Here the speed and amount of energy moves from the periphery inwards, approaching a point of infinity within. This is what Schauberger called a biological vacuum. The energy generated he called implosion to contrast it with the explosion that takes place in a combustion engine.

Under the conditions we find at the tip of the vortex there is nothing else than surface tension This tension is like an internal pressure: it increases with the decreasing size of a droplet. The pressure difference becomes enormous when moving toward the molecular size. Practically speaking, the fluid reaches a state in which it is torn apart. "Physical conditions in this center surpass the loading capacity of material substance beyond all measure. The most attenuated ethereal medium cannot withstand such an immeasurably great suction, such abnormal stress. Physical substance bursts asunder under such impossible conditions" comments physicist Georg Blattmann.[2] We are reaching a boundary between two orders of reality, one visible and well-known, the other no less real, though only understandable by a qualitatively different kind of thinking than Euclidian geometry and ordinary mathematics.

The scientist Patrick Flanagan perfected a laboratory arrangement in which he used a clear egg-shaped ellipsoid, a nearly cylindrical vessel, with a hole pierced through the bottom. The rhythmic pulsations and movements of the layers of water moving at different speeds were made visible through drops of food coloring. When the speed of rotation is increased the diameter of the vortex throat shrinks. We saw that as the diameter approaches zero,

[2] Georg Blattmann, *The Sun: The Ancient Mysteries and a New* Physics, 71.

the velocity approaches infinity. Flanagan carefully measured the electrical charge of the vortex with a wire electrode set into the center of the throat—but without touching water—and another one in contact with the water. At 1000 rpms he recorded an electrical potential of more than 10,000 volts.[3] He also tested the systems by reversing the direction of rotation, concluding "Steiner's idea that an energy enters the water each time the direction of stirring is reversed [e.g., in the stirring of biodynamic preparations] is right on the mark." Looking specifically at what happens when the main vortices collapse led him to the observation that the water is then filled with millions, if not billions of minute vortices. Relating to the rhythmical stirring of biodynamic preparations he concluded that the energy "has to be absorbed into the hydrogen bonds of the water and be absorbed into the particles of the 500, rendering them colloidal, and readily ingestible by both the microorganisms and the hungry single-celled root hairs of plants.[4]

Much more can be said about the kind of motion that is akin to that of a vortex. Many features of Schauberger's inventions revolve around this seemingly simple phenomenon, which is visible in forms of increasing complexity in water. It plays a primordial role in rivers, a determining role on their state of health.

Thinking in Polarities

We have just witnessed in the vortex a term that forms a contrast with most common experiences that are offered to our senses. We are familiar with, and can understand intellectually, the phenomena of gravity, the working of explosion engines, or everything that has to do with weight, measure and number. The phenomenon of the vortex forms a perfect counterweight to that of the waterfall. The latter can be explained by the commonly known physical laws mentioned above; the former asks us to make recourse to a qualitatively different kind of thinking.

Understanding Nature means reconciling apparent contradictions or mutually limiting antitheses; life and death, wakefulness and sleep, light and darkness, expansion and contraction, lightness and heaviness, etc. In Nature these opposites work in and through each other; they are the terms of a polarity. They are like parts of a continuum, where one of the two, though predominant, always works with the other, even when we move toward the end of the continuum. At the center of these contrasts lies the question of quality, which will lead us to a breakthrough in the understanding of Nature.

---

[3] Peter Tompkins and Christopher Bird, *Secrets of the Soil: A Fascinating Account of Recent Breakthroughs- Scientific and Spiritual- That Can Save Your Garden or Farm*, 106-09.

[4] Ibid, 113. Flanagan is here referring to the stirring of the biodynamic preparation horn-manure, or 500, which is stirred clockwise and anti-clockwise in order to form vortices in rhythmical alternation.

Why is quality important? To the accurate observer it is clear that nothing is ever the same/identical in Nature. Here always appear the greatest change and heterogeneity. Nothing can be gained for evolutionary purposes from sameness and repetition. Life is created out of differences, however minute and subtle.

Modern scientific observation knows Nature in its quantitative aspects. No qualitative aspects enter the equation unless they can be first defined and then turned into a quantitative analysis; but then we are back to square one. This limitation of science to the purely quantitative rests on the exclusive use of indirect observation/measurement through technological means (chemical analysis, spectroscopes, X-rays, Geiger counter, electrical measurements, etc.) or reliance on passive sense experience—experiences which are not strengthened through deeper integration and phenomena-based thinking, as one does in Goethean science.

Qualities cannot be understood without an active sense experience. They remain occult. In the Goethean approach, the terms of polarity can be reconciled by bringing together the analytical element of thought with the feeling element in art, as Schauberger himself intuited. The rigorous scientific analysis can be strengthened by the no less rigorous, but subtle, living feeling/artistic perception. This is how Goethe brought science to a new level. Through him passive thinking became active, living thinking. He achieved what Rudolf Steiner called "Imagination", a sense-free perception of the archetypes behind physical reality. Schauberger worked very much in the same direction. Like Goethe he left us the results that we can now begin to understand through a spiritual scientific approach, though needing to overcome the difficult problem of the author's language, especially for those of us who do not have direct spiritual perception.

Goethe's work led, among other things, to the concept/experience of polarity, which is central to the sampling of phenomena we have already announced and to the deeper exploration that will follow. In Goethe's work these were the polarities of horizontal/vertical, light and darkness, Earth and Sun, expansion and contraction, etc. In polarities we can say that quantity is the thesis and quality the antithesis. However, quality is the determining factor. Quality is the differentiator and animator of life. An example of this: levity is what allows the phenomenon of gravity; the latter is the force of resistance. Gravity is present within restricted conditions within our solar system, levity is much more pervasive.

In commenting on Schauberger's work Callum Coats indicates that the polarities of cold and heat, suction and pressure, explosion and implosion, centripetence and centrifugence are the antitheses and "the agencies of self-organizing, intermediate, vibratory matrices of immaterial energies by which the gap between the Will-to-create and creation, spirit and matter,

and idea and manifestation is bridged."[5] The full attainment of one term of the polarity would fully negate the reality of the other term, but also negate itself because it is only justified in a relationship. In the timeless dimension polarity corresponds to two sides of a single power. The higher unity outside of time becomes opposition in the realm of duality. At the purely intellectual level polarity is a paradox; at the level of experience it is lived as a mystery. Through the attainment of Imagination, and further forms of cognition, it can it be both understood and experienced.

At the human level polarity embraces the core of our being and deeper experience of life itself. It is through the existential agency of polarity that each one of us can experience being truly individualized, while at the same time truly universal. In fact the more individualized we become, the more universal we can feel. This is a primeval, existential kind of polarity.

As part of Schauberger's "thinking in higher octaves," and central to our understanding of everything that will follow is the encompassing of polarities:

Matter	Spirit
Heat	Cold
Gravity	Levity
Pressure	Suction
Explosion	Implosion
Centrifugence	Centripetence
Oxygen(es) (Sun)	Carbones (Earth)

An example that will be central to our understanding of water: the polarity of cold and heat. Currently there is only one view about the polarity of heat and cold: heat rises and expands and cold sinks and contracts. And this is valid within all technological systems. But Nature also uses the opposites of rising and expanding cold and falling and concentrating heat.

A very common example will suffice. During daytime, if we go from the top to a bottom of a valley we experience increasing warmth (falling and concentrating heat); when we ascend it becomes progressively cooler (rising and expanding cold). At night the process is reversed; as we descend the air is chillier and denser (falling and concentrating cold) and as we ascend the air warms (rising and expanding heat). The rising and expanding cold and falling and concentrating heat is what makes life possible, and they must prevail over their counterparts. They have a life affirming function, leading to what we can call "cold, formative, metabolic processes." The reverse—falling and concentrating cold and rising and expanding heat—is what Nature uses for organic decomposition, for decay without putrefaction. At present these are the processes exclusively used and amplified in modern technology.

[5] Callum Coats, *Living Energies* 74.

Continuing the work of his father, Walter Schauberger indicates "The manifestation of all natural forces is the result of the interaction between two opposites, neither of which ever reaches totality in the lower realm of duality (the physical world), for they can only become total when they unite within their unifying, nonphysical, governing principle. In the physical world each component of a pair of forces can only attain 96% of its boundary or extreme condition. Once this point is reached, then its opposite force gradually begins to gain strength."[6] An example: in a vacuum there is always a 4% left of the medium to be evacuated.

Armed with the understanding of polarity we will ask questions that modern science doesn't ask even when it meets with outer phenomena that defy simple understanding. Most of the time these, it seems, cannot even be recognized. They were seen, however, by Goethe, Steiner, Hauschka, Schauberger and many others.

A Fuller Understanding of Water

"In Nature all life is a question of the minutest, but extremely precisely graduated differences in the particular thermal motion within every single body, which continuously changes in rhythm with the processes of pulsation."[7]

Viktor Schauberger

If Schauberger's motto "Good water—good life! Bad water—bad life! No water—no life!" may sound simplistic at this point, I invite you to revisit it at the end of this or the next chapter. Upon the very precise premise of good water, Schauberger envisioned how to transport timber and materials down steep slope gradients through log-flumes; regulate watercourses without embankment works; control the river flow through the temperature gradient and the help of flow-deflecting guides; raise the height of the water table around the rivers; produce high-grade drinking water; render dams more long-lasting and avoid the problems they generate in their water discharge due to temperature differentials; raise water without pumping devices, etc.

<u>Water's Unique Properties</u>

Schauberger's reasons cogently that since without death there would be no life, there must be two forms of motion. There is on one hand a motion that produces/maintains what is alive, and on the other a condition that sets the stage/preconditions for this to happen from what is decayed, and these are two completely different kinds of motion. On one side what we will recognize as planetary motion—to which our exploration of the vortex has already pointed—a motion that is the prerequisite for everything that

[6] Callum Coats, *Living* Energies, 62.
[7] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 6.

manifests life, and on the other a motion that brings about the formation of those products through which the first one can operate. This is in fact the kernel of our present exploration. But before that we will turn to water's unique properties.

Water behaves in ways hardly conceivable from general chemical theory. In comparison with similar substances one would expect its freezing point to be at –120°C (-184°F), its boiling point at –75°C (-103°F).[8] That this is not so is what renders life on Earth possible. Water also has the highest surface tension among comparable substances, another of its important traits. This is what allows a dewdrop to maintain its coherence. Water also has a great dielectric value. A vacuum has a dielectric value of 1; pure water of 81. It's almost the highest dielectric value in Nature, conferring a great innate resistance to the transfer of charge. Water thus allows for large electric fields in living cells as we have seen in the case of the vortex. Not surprisingly water also has a great specific heat, which means great inertia to changes of temperature. Given a certain amount of heat, the temperature of water rises more slowly than that of similar materials.

Water dissolves oxygen, nitrogen, carbon dioxide, from the air, calcium, potassium, sodium, manganese, and many other elements from the rocks. It combines in fact with more substances than any other molecule and is called for this reason the "universal solvent." Both water and our bodies contain 84 elements [of 103 known elements] in the same proportion."[9] Water collects all these substances and deposits them for new growth.

Water sacrifices itself completely to the environment, for good of for bad. In its circulation through atmosphere and soil it will evolve from an immature state—generally associated with little substance in solution and gases—to a mature state in which it accumulates dissolved solid substances and gases. When it is healthy it pulsates like blood, it spirals and vibrates, and this in turn maintains its vitality. To quite a degree it purifies. However, when it is immature, or degraded/polluted, it greedily takes up minerals and nutrients. When immature it will take out minerals and trace elements out of our bodies.

The movement generated by the vortices in flowing water creates micro-clusters and a complex laminar structure which can be observed under a microscope. The structures are called "crystalline-fluid" because they display a degree of order almost as high as that of a crystal. The clusters can store vibrational impressions or 'imprints'. Higher order clusters water vibrates at high frequencies.[10] At +37°C water can form clusters of 300 to 400 molecules; the colder the temperature the longer the clusters will

[8] Jochen Schwuchow, John Wilkes, Iain Trousdell, *Energizing Water*, 10.
[9] Alick Bartholomew, *Hidden Nature*, 109.
[10] Jochen Schwuchow, John Wilkes, Iain Trousdell, *Energizing Water*, 83.

become.[11] This structure probably increases as we get to the boundary temperature of +4°C, with the approaching of the full moon, etc.

The greater the activity of vortices the more water can store information. With beneficial imprints water health can be restored a little bit like through homeopathy. The opposite is true of degraded, damaged water in the negative direction. We know through the work of Masaru Emoto that water considered legally potable may not be able to crystallize, meaning it has lost vitality and still carries the information of the initial pollutants. Safe to drink and good to drink are two worlds apart! This is because water can maintain the information of substances it has dissolved, even if they are no longer there.

Harmful substances have specific frequencies, and water, it seems, absorbs them as soon as it enters in contact with them, leading Schwuchow and others to conclude "The photon (quantum light) spectrum of contaminated water thus differs very significantly from that of clean water."[12] And even after physico-chemical treatment these frequencies continue to be harmful for human use. Not only that: water thus processed most often loses its rhythm/movement properties.

In order to erase the information imprinted on water we can heat it at 400°C, or submit it to vigorous vortexing. This is what happens in homeopathy or in flowforms, in both instances through specific kinds of motion. This is also what is done in a growing variety of water devices, which first create chaos (vortexing), then eventually reimprint new information into the flowing water. An example is the Grander water device, which uses high frequency water, encased in a devise to reprogram water after submitting it to vortexing. The two waters do not enter into physical contact[13]. On a much larger scale Schauberger tried to restore water's health through reintroducing natural movement in the river-bed.

<u>New Findings</u>

Schauberger applied much of his research to understanding the nature of water through a variety of complementary and overlapping approaches. Water has a cycle in which it goes from the atmosphere to the underground and back again. Forests and rivers, have a tremendous impact on this cycle. Basically, according to how rivers and forests are managed we have two very different global outcomes. All of this can only be understood if we first address water's qualities, those that are created by the interaction of

[11] Jochen Schwuchow, John Wilkes, Iain Trousdell, *Energizing Water*, 10.
[12] Jochen Schwuchow, John Wilkes, Iain Trousdell, *Energizing Water*, 14.
[13] Hans Kronberger and Siegbert Lattacher, *On the Track of Water's Secrets: from Viktor Schauberger to Johannes Grander*; for an understanding of Grander's water device see Chapter 4. Another one known to the author are the devices of Natural Action Technologies developed by Clayton Nolte or the The Living Water Vortex jug developed by Clean Water in Denmark. This is to say that this is a growing field and what is shared here is part of a larger whole.

temperature and motion. We will return to the ultimate aspects of the question, and how the water cycle is affected at the end of the next chapter. This is because this is part of a complex understanding that needs to be built up patiently.

A primary aspect of the cycle of water is the one involving the integration of chemical compounds from atmosphere and geosphere. Water is continuously weaving between heights and depths, and can only reach an optimal state of balance and health through the integration of these. Sun and Earth and their influences form a polarity in the growth of that living organism which is water. High quality, mature water contains a balance of geospheric and atmospheric elements and energies. In accordance with much of traditional knowledge Schauberger attributed to the first a feminine quality, to the second ones a masculine quality.

To understand the maturation of water we will look at the contrast between "carbones" and oxygen. What Coats translated as carbones is what Schauberger understood as "Kohle-stoffe" or "mother substances."[14] Under the term carbones are grouped all compounds of carbon, dissolved salts and all other mineral and metal compounds, all except oxygen and hydrogen. The term acquires a fuller meaning when we recognize the importance of carbon rich substances in coal and oil reserves which Schauberger saw as the source of carbones for the production of a good, healthy water, rich in carbonic acid as the water rises from the depths. Carbones and oxygen play a complementary role in relation to temperature and motion which will be critical to water's behavior. Before going into details we can indicate that when one is active the other becomes passive and vice-versa.

On their ascending movement through the soil, water rich in carbones generates subtle etheric energy, levitational forces overcoming the forces of gravity. They seek to be fertilized/are attracted by the descending oxygen and their male fine energies counterpart.

Mature water acquires its highest levitative force when it rises through the layers of the Earth: the longer the path the water travels the riper it will become. The most mature water is spring water, which contains a large amount of dissolved salts and a high quota of free and bound gases (e.g., CO_2 and O_2).[15] At the other end of the spectrum lies rain-water, a form of juvenile water, far from the state of equilibrium of mature water, with a high oxygen content, little or no dissolved carbon dioxide or carbonic acid (H2CO3), and little or no salts.

When the downward movement of oxygen intersects with the upward movement of carbones, energy is made available. "Through the resistance

[14] Viktor Schauberger, Callum Coats editor, *Nature as Teacher*, 17.
[15] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 72.

arising from the interactions between carbone and oxygen, fluctuations in temperature again occur and with them the impulse to move—the pulsation of water, which in this way at times dissolves salts and at others deposits them, transports them, creates energies and transforms them."[16] To understand the pulsation of water consider that water moving toward the anomaly point of $+4^0$C breathes in—acquires more gases, condenses. Water moving away from the anomaly point deposits gases and substances and expands; it breathes out. At $+4\ ^0$C water has a host of unique characteristics to which we will return; this is the temperature at which it acquires its highest density and the one in which it can dissolve the highest amount of salts and gases in solution. For this reason it has been called the anomaly point.

The utmost difference between kinds of water is their behavior in the ground and in the human body. In moving from the depths to the surface, water changes from being a "taker" into being a "giver". It either absorbs from the ground or dissolves. At the end of its maturation water can deliver the widest variety of dissolved compounds and ionized elements in homeopathic doses to the living systems of its environment. In the zone of the roots the associated microorganisms, living in symbiosis, transform the carried substances into larger molecules which are transported by the capillaries of the roots.

Juvenile and Mature Waters

Let us look at the different kinds of water, from rainwater to spring water. It is well-known that distilled water is not fit for human consumption. It is brought out here because it highlights much of what follows. Distilled water is the most extreme example of "synthetic juvenile-like" water. Because it is so far from a state of equilibrium it greedily absorbs everything that comes to meet it. This water lacks qualities and what Schauberger calls "character"; therefore it absorbs gaseous substances and removes carbones from the organism, causing harm to the human body.

Rainwater is the purest available water with mostly oxygen content, but unsuitable for drinking; neither is snow water. Among other immature/juvenile kinds of waters are deep well water or geyser waters, both from deep underground sources. They contain some minerals but few gases. Surface water, like that of dams and reservoirs may originally have been mature, but the more it is exposed to light and heat the more it deteriorates.

Groundwater originally has dissolved carbones and trace salts; it is water of a higher quality. We are approaching thus to the best and healthiest kind of water: spring water. Water flowing from healthy springs is only to be found in healthy high-quality forests. Here we find a reality that often contradicts deeply held scientific beliefs, and that Schauberger's discoveries

[16] Viktor Schauberger, Callum Coats editor, *the Energy Evolution*, 7.

render understandable. The artesian hypothesis of springs so entrenched in conventional hydrology—that springs cannot emerge unless there is surrounding water at higher heights—doesn't hold true for springs which lie far above any significant accumulation of water. A spring on the High Priel, west of Salzburg, gushes forth 300' below the summit located at 6,500'. Another example, among many, is that of a spring on Mount Rareu (Bukowina, in Czech Republic) coming out of a rocky outcrop toward the summit.[17] Schauberger indicated a number of differences between true springs and artesian springs/seepage springs. Artesian springs come from water that enters the ground, hits an impervious layer and drains out under the effect of gravity. A true spring defies gravity. The temperature of artesian springs is also different from that of true springs, generally approaching that of the ground layer and in the order of +6 to +9^{0}C, instead of +4^{0}C for a true spring. Seepage springs are also generally poorer in dissolved salts and trace elements.[18]

Quality in spring waters, indicates Schauberger, is often shown by "shimmering, vibrant, bluish color." Spring water is often deficient in oxygen, but rich in carbonic acid. It should not be drunk directly from the spring because it will seek to acquire oxygen; it is better to drink within ten yards from the source.

The important quality-related aspect, which says much about springs if we want to understand their origin, is the fact they always emerge at temperatures very close to +4°C, and the paradox that spring water can actually flow strongest during the daytime and in summer. Likewise they also deliver cooler waters and rise higher in summer than in winter, happily contradicting purely physical laws.[19]

Springwater, emerging at +4°C, can carry most solids in suspension and gases in solution. This is why in newly bottled spring water bubbles form on the sides of the glass due to its CO_2. In springs the higher the water rises, the heavier the minerals it precipitates, thus becoming denser.[20]

The abundance of springs has been greatly affected by the treatment of forests in the last centuries. The disappearance of springs is a massive ecological change that has passed under the radar, but it doesn't escape the notice of holistic scientists even almost two centuries ago. Speaking about Lake Valencia in Venezuela Alexander von Humboldt (1769 - 1859)

---

[17] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 90.
[18] Callum Coats, *Living Energies*, 129.
[19] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 77, 99. An example quoted by Schauberger is that of a "wandering spring" in the mountains of Montenegro; in summer it emerges up the mountain, in the winter down in the valley. Viktor Schauberger, Callum Coats editor, *Nature as Teacher*, 67.
[20] Schauberger devised a laboratory experiment with communicating vases to show how water rises in springs, defying gravity (Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 50-52).

said "the clearing of planes and the cultivation of indigo over a half a century has affected the amount of water flowing in, as well as the evaporation from the soil; springs dry up, or merely trickle. Riverbeds remain dry and are then turned into torrents whenever it rains heavily on the hills. By felling trees that cover the mountains men everywhere have ensured at the same time two future calamities, lack of fuel and scarcity of water."[21] A century ahead of the science of ecology Humboldt was able to articulate some of the finer observations to which we will return with more background information. Adding my voice to those of scientists, I am bewildered that, although I live in rural, forested Vermont, springs are a very rare occurrence, and I don't know of any in my neighborhood, except for those under a man-made pond. A constant hiker I have not come across any of those; at most a seepage spring which dries up in the summer season.

The wonder of the formation of springs has not been approached yet because it rests on the understanding of the temperature gradient, to which we will return promptly.

Water and Temperature: The Anomaly Layer and Temperature Gradients

"Nature's creativity, however, thrives on measured coolness."[22]

Water is the liquid which has the greatest capacity to store heat; it absorbs it and releases it slowly. It also behaves abnormally in relation to temperature; it contracts to a maximum at +4°C (39 °F), then expands again upon freezing. At this anomaly point turbulence is also at a minimum, whereas it accelerates the more we move away from +4°C. At the anomaly point, water attains its highest density, which also means its highest energy/life-force content. The layer at +4°C is so important that is has been called the "boundary layer," the "anomaly layer" and with good reason the "temperature-less layer." It is no wonder that the ocean waters are most productive at these temperatures, as is the case off the coasts of Peru and Chili, thanks to the cold Humboldt Current.

Healthy water will naturally seek to flow in darkness or shade, avoiding heat and direct sunlight. A course of water left to itself will shade its waters with trees upstream, and protect its waters through the shading effect of sediments in suspension (turbidity), which has a cooling effect, when it broadens downstream.

The number one enemy of water is excess heat or over-exposure to the Sun's rays. The behavior of aquatic plants in waters protected from light and heat points to an important reality about etheric forces. Schauberger observed that at temperatures close to +4°C moss and other aquatic plants'

[21] https://www.youtube.com/watch?v=pgvX0QdYI6M
[22] Alick Bartholomew, *Hidden Nature*, 34.

shoots stand at right angles with the direction of the current. They point downstream, as we would expect, when the temperature deviates strongly from +4°C.[23] In other words aquatic plants align themselves not with the physical stream alone but with the etheric stream, which is at a maximum due to spring water temperature and chemical composition.

A series of other temperature thresholds are worth being noticed. At 37.5°C (99.5°F) water's specific heat—speed at which it absorbs or releases heat—is lowest, giving it the capacity to exchange large amounts of heat faster. Once the water temperature rises above +9°C (48°F) the oxygen becomes more and more active and aggressive. increasingly promoting decomposition and encouraging pathogenic bacteria as it rises. Below a temperature of +9°C oxygen is used for growth. At +4°C the carbones in gas form, enlivened with buoyancy, are finely dispersed in the water. The oxygen, by comparison, is very condensed, and it sinks; it becomes inactive. This theme of inverse relationship between the activities of carbones and oxygen is one that will return in many natural observations and in Schauberger's applied technology.

One important notion for all of the activity of Nature and the circulation of water is that of the temperature gradient. A positive temperature gradient approaches the anomaly point of +4°C from above or from below; we will consider from now on the one from above. A negative temperature gradient moves away from the anomaly point. We can say that water moving toward the anomaly point breathes in—acquires more gases, condenses—water moving away from it breathes out. The positive temperature gradient is accompanied with reduction processes, the negative temperature with oxidation processes.

Positive gradients are used by Nature in creating life forms. With a positive gradient ionized substances are drawn together for productive interchange, oxygen becomes passive and bound by the carbones. With negative temperature gradients the warmed-up oxygen becomes more and more aggressive and attacks healthy structures. Both gradients work together, but for health to prevail in water circulation the positive gradient must prevail, as we will see in much of what follows.

The temperature gradient influences nutrient uptake. How this works out can be seen in the soil and in the tree sap. In the soil, under a positive temperature gradient, usually under the shade of trees, all the various nutrients and salts are deposited well below the ground surface as the water cools to +4°C. In the case of a negative temperature gradient, however, due to heat evaporation and little penetration, the lowest quality nutrients are precipitated at the surface, which not only has dire consequences for soil fertility, but also for the proper formation of trees.

[23] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 144.

In the tree under a positive temperature gradient the highest quality nutrients are precipitated last as the sap cools towards $+4^0$C or is maintained at this temperature. Under a strong negative temperature gradient—as in the case of trees exposed directly to the heat of the Sun—the opposite takes place and only the lowest quality nutrients are expelled; the highest quality ones are not transported at all.

Life emerges at the intersection of contrasting gradients, but for long-term sustainability the positive gradient must predominate. Alick Bartholomew sums it up thus "… if the positive temperature gradient is very powerful, then the effect of the reciprocally weaker negative temperature gradient is beneficial and promotes the outbreath into physical form of the highest quality substances."[24] In the contrary instance the outcome leads to substances of inferior quality. In agriculture, in forestry, in river management, dams and reservoirs, engines, industrial and domestic heating, the pattern has been the same, replacing positive gradients with negative ones, or further enhancing the latter.

Once more Schauberger was able to observe amazing phenomena as one approaches the anomaly point. He observed and understood an otherwise known piece of lore of old. When two almost identical pebbles rub together under cool waters, a fiery glow is clearly perceptible. In this phenomenon, called "triboluminescence." the fire is not extinguished by water. This energy doesn't cause any electrical disturbances in electronic devices, indicating it's another kind of electricity than the one we know, a bio-electricity we could say. Thus, a kind of energy is freed but one of which science has little understanding because it cannot apprehend polarities. Our explorations will approach this other type of energy in deeper and deeper ways.

Planetary Motion

We can best understand the natural motion of water if we refer it to the movement of the Earth, which it mirrors. The Earth spins on its own axis, engendering day and night (rotational motion) and around the Sun (orbital motion) to give us the seasons; the solar system moves within the galaxy giving rise to astrological ages. The liquids on the Earth's surface mirror these movements. This is what is called in mathematical terms a "cycloid-space-curve." This is why Schauberger refers to the natural movement of water as "planetary motion."

[24] Alick Bartholomew, *Hidden Nature*, 117.

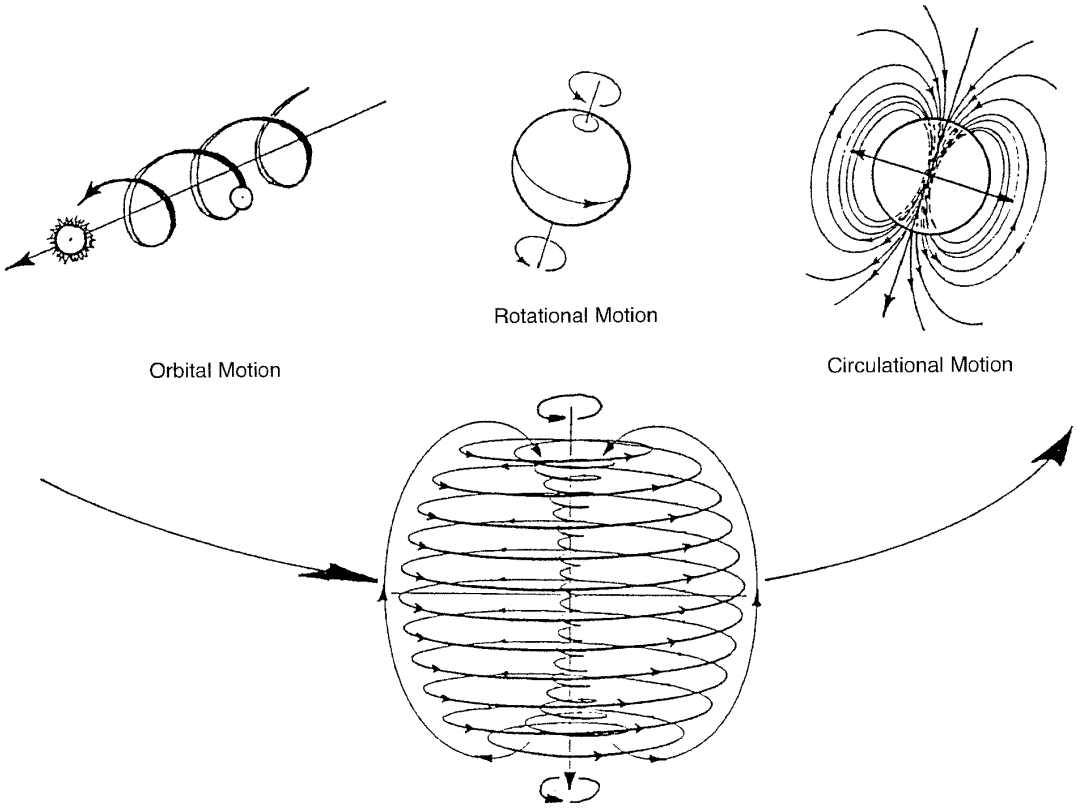

Figure 8: Three basic forms of motion and their combined result

Water in a river bed mirrors these movements:

- It rotates on its own axis: a motion, similar to the axis of rotation of the Earth.
- It meanders as the Earth spirals around the Sun
- The whole spirals in a space curve, mirroring the whole movement of the galaxy

Combining the movements, the river's core waters will flow in longitudinal vortices which have a cooling effect when the river is healthy. This movement will alternate between clockwise or anti-clockwise as the river meanders from right to left and back to right. Another example: in a vortex produced in a glass column of water in laboratory conditions, water naturally swirls around its center anti-clockwise in the northern hemisphere. Moreover, it will display oscillating rhythm of movement of the central vortex itself and finally a breathing rhythm of the whole. Altogether it gives rise to the "cycloid-spiral space curve", or more simply from now on, planetary motion." In a flow-form you can observe how the water oscillates rhythmically in each basin, but also how a rhythm and periodicity is established in the movements between basins.

Vortex and spiral are for Schauberger the keys for understanding all creative movement. The vortex has a clearing, purifying and energizing

effect on water. It brings it back to a nascent state where it gets rid of all previous negative influences. It begins the process of creating greater diversity and complexity. This principle is used in homeopathy where substance is brought back to its nascent stage, which expresses itself as formative force.

When we look at a river we can also recognize two broad types of water flow, which form a polarity:

- Laminar: the stratified and unimpeded flow of water down an inclined plane. In this kind of flow the layers of water run parallel to each other without mixing. It is said that this is most often the case with low speeds and in fluids of high viscosity. But in water laminar flow is strongest close to the boundary layer of 4 °C, even at high speeds, as we have seen. In this instance water does not accelerate.
- Turbulent: at present this is attributed to mechanical effects alone, e.g., in the mixing of different kinds of water. But turbulence also increases with temperature and negative temperature gradients.

Schauberger adds that "turbulent phenomena in water are nothing less than the counter-motion to laminar flow—arising from physical causes and generating vertical currents in flowing water, maintaining the steadiness of the descending flow through the creation of transverse currents."[25] Turbulence has a braking effect on the flow of water. In what follows we will see how the two types of flow interact in the longitudinal and cross sections of a river.

Two maxims are central to everything that happens in water and by extension in Nature: "All life springs from water" and "All life arises from motion." And since there would be no life without death/decay we can expect to see two completely different kinds of motion, as there are in fact. One produces the conditions for life and another creates the preconditions for this to happen. One of them, planetary motion, produces the physical forms, whereas the other initiates the processes through which the products of the first form of motion can be brought into being. The second one, producing decomposition is the one we are more familiar with, a motion akin to analysis; the first kind of motion is one of synthesis. The two together form a "bio-dynamic movement." Schauberger qualifies the motion of synthesis as the one that overcomes gravity and brings about the "densation" of matter. [26] By densation he means the refining and energizing of matter, which leads to the release of levitational/etheric forces.

In what we just explored Schauberger hits upon the differentiation between the forces of levity (etheric forces) and those of gravity. In geometrical

[25] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 138-39.
[26] Viktor Schauberger, Callum Coats editor, *The Energy Evolution*, 127-28.

terms the difference has been made clear by George Adams with the contrast of space and counter-space. In an example of this we can characterize a line as the sum of an infinity of points in both directions. This is the current view of space.

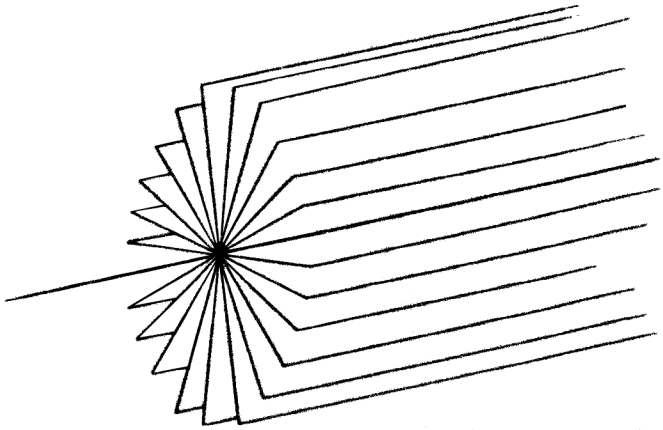

Figure 9: The line as the meeting place of planes

From the counter-space perspective, a line can be seen as the encounter of planes coming from the periphery and intersecting / converging towards the infinity within, the line itself. If we take the definition of the point from this perspective we can say that this is the intersection of infinity of lines originating from the periphery and converging towards an infinity within.

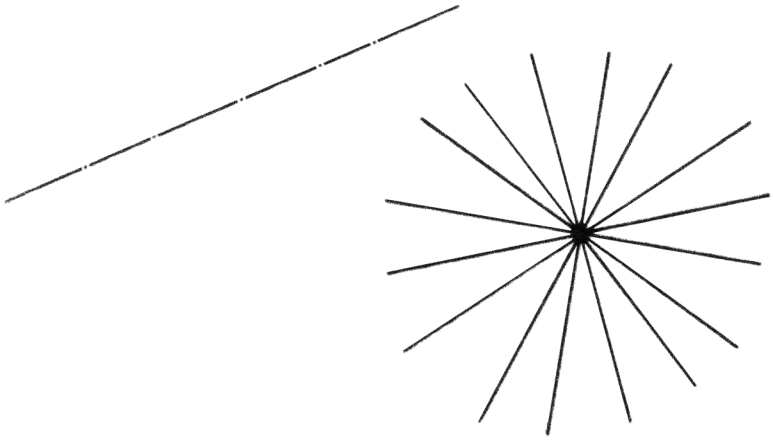

Figure 10: Points to line and lines to point

One perspective gives us the origin in the center and the infinity without, the other the origin without and the infinity within (in the point). The example of the vortex corresponds to the second kind of perspective; the eye of the vortex or of a tornado is an infinity within, the point in which all of energy concentrates from without. Viktor Schauberger made these ideas perceptible in the motion of water and in the generation of energy.

In essence Nature uses two kinds of motion: the one with which we are completely familiar, which is centrifugal (having an infinity without). The one that only Goethean/phenomenological, or spiritual science, can apprehend is centripetal (infinity within). To the first we will add the motion that is human-generated in technology. It is a force of decomposition but modified and accelerated by recourse to very high temperatures. This is why Schauberger also refers to centrifugal motion as "technological motion" and centripetal motion as "planetary motion." Each kind of motion generates a set of resulting conditions. Let's look at these in more detail.

The centrifugal motion used in technology generates heat and decomposes. It fragments, creates chaos, noise and heat, in essence it increases disorder/entropy. Almost all of our technology on is based on explosion and generates heat and entropy. What happens in controlled manner in Nature at moderate temperatures is accentuated in technology at far higher temperatures.

With centrifugal motion and the prevalence of oxidation one obtains over-acidification, leading to products of emulsion like fatty acids bound by oxygen. At temperatures above +40°C a spark will cause immediate combustion. Pressure turbines are good examples of such motion, where degrading, electrolytic forces develop, causing effects similar to what happens with electricity through air or water. This motion, if acting alone, would lead to sterility and inability to reproduce.

Centripetal, or planetary, motion is a vortical form of motion, moving from the outside to the inside with increasing velocity, which acts to cool, to condense, to structure, assisting the emergence of higher quality and more complex systems. This motion is inwinding, as what we have seen in the vortex; it "narrows towards a point," the infinity within of our theoretical considerations. It is an upbuilding kind of motion, which is silent and cools off substances. In Nature this can be seen in the in-winding movement of the cyclone, whose center is cool. Planetary motion densifies structure; it is creative, convergent and formative. In this kind of movement suction increases and friction is reduced: speed and energy increase automatically.

Without levitational forces there would be no circulation of sap, blood or water. These are not raised mechanically, but 'sucked up' by levitational forces, which move according to planetary motion. The densification is not a phenomenon limited to physical space alone. On the contrary, matter is raised to a spaceless condition; it is etherealized. Schauberger explains: "The relation between the material, energetic and more subtle worlds should be perceived as a pyramid, wherein coarser, less energetic matter occupies the lower portion. As the volume reduces with height [rising in the atmosphere], the proportion between matter and energy gradually

reverses until at the very apex all that is left is extremely fine matter or energies in a subtle or etheric state …"[27]

In centrifugal/technical motion the resistance to movement (friction) increases by the square of the velocity whereas there is no resistance to motion in planetary motion. Here, Schauberger claims the resistance falls "by the square of the velocity of a falling heat gradient", defying the law of conservation of energy.[28] To render this understandable we must remember that planetary motion has a cooling effect, bringing water toward the anomaly point. The lack of friction is due to the strengthening of the longitudinal vortical movement in the core-body of water and the release of substances from the walls of the pipes, or banks of the river, as we will see shortly.[29] In Schauberger's work this was demonstrated in the 1952 experiments on water pipes conducted with Professor Pöpel.

For the purpose of all that will follow it is important to understand the ultimate implications of the two kinds of motion. Planetary motion enhances quality and the production of etheric forces. It moves towards what Hauschka calls dematerialization. It does in effect transform substance in the same direction of homeopathy. This is no wonder since homeopathy itself transforms substance through the vortexing movements of potentization—an example of planetary motion.

In natural systems planetary motion also favors those species that depend on high quality environments (e.g., trout), or plants that depend on pure water (e.g. water cress), rather than carps, bottom feeders or algae. Even at present, we can see that where water is not polluted, the river banks are shaded and/or the river has not been regulated, the trout survives; where these conditions have changed, as in the vast majority of streams, it will no longer be found. The contrast can even be seen between the upper basin and lower basins of a same river, when conditions change. Centrifugal motion—as we will see in the example of a poorly regulated river—will eliminate the more demanding species and encourage not just algal infestation, but also parasites. Lower, more ancient and less demanding, forms of life will predominate at the expense of those that are present in the best-preserved ecosystems. It was not hyperbole that brought Schauberger to equate the fate of the trout to that of our culture in general.

We are finding ourselves at a pivotal time of societal choices. Schauberger, like most representatives of Goethean and/or spiritual scientific natural sciences, underlines the importance of qualitative factors in Nature. He will

---

[27] Viktor Schauberger, Callum Coats editor, *The Fertile Earth*, 22-23.
[28] Viktor Schauberger, Callum Coats editor, *the Energy Evolution*, 74. Here Schauberger is probably referring to the phenomenon of cooling which takes place within a mass of cooling substance, typically water or air, when submitted to planetary motion. The faster the substance cools off, the more friction is overcome.
[29] Viktor Schauberger, Callum Coats editor, *the Energy* Evolution, 74.

show us how the movement of water in a river depends on delicate balances of temperature gradients and upbuilding motion in order to preserve higher quality.

The conversation and choices around qualitative factors in Nature affect the very own fate of these factors in ways that can only be perceived … when we honor the qualitative element. In other words, a scientific perspective of input/output, conservation of energy and matter, inexorability of the downward pull of entropy; denial of the etheric forces will carry a downward trend in which quality will decrease, but such a decrease will not be perceived because … it is not considered important in the first place. Much of the matter of river conservation, which has gone undisturbed and unquestioned for centuries, confirms this trend. All quality is almost absent from major rivers of the northern hemisphere because of the prevailing assumptions of modern hydraulics, which does not recognize the effect of subtle influences and does not address the question of quality other than in marginal ways.

River Health

A healthy, naturally-flowing river creates the best conditions for its banks and the vegetation it needs to enhance its vitality and stabilize its course. When that is the case it maintains its energies within bounds and rarely overflows.

A river follows on its path to lower ground a series of roughly three stages;

- *Youthful Stage: immature water*

  Immature, cold water is hungry for minerals. It gets actively oxygenated in rapids and waterfalls and takes on generative energies.

- *Intermediate Stage: mature water*

  The flow slows, some of the heaviest matter is deposited. A natural river at this stage is protected from excessive warming by the trees on its banks and it recharges the groundwater.

- *Final stage: the plains*

  The river starts to create meanders and floods, leaving behind oxbow crescent ponds. The soil is re-mineralized and becomes much more productive. Differences of temperature become very subtle, changing the water gradient, and influencing whether the water removes, transports or deposits sediment. Here turbidity plays an important role in protecting the deeper strata from direct heat, so that they can retain carrying capacity and prevent flooding.

Over the course of its flow to the sea there is a natural pulsation in segments of rivers between sections with positive and negative temperature gradients. In a positive temperature gradient stretch the water gradually heats up after a while, giving way to a negative temperature gradient section. When that happens it deposits sediments and forms barrel vortices immediately downstream, with cooling effect which allow the

stream to pick up sediments anew. This amounts to a natural pulsation, a breathing with the positive temperature gradient as the inbreath, with matter being absorbed and an outbreath in the negative temperature gradient part. A more holistic regulation of the river amounts to increasing the length of the positive gradient sections. When that is done danger of flooding is reduced.

Another important factor plays a role in preserving the natural pulsation of a river; this lies in understanding the forming of its bends. Here we see a superposition of various vortical movements, which create polarities, primarily three among them:

- Longitudinal vortex generated at the river bend. The coldest water closest to the center moves fastest pulling the outer water layers. This is called the "core-water" where the most vitalizing elements and energies accumulate in emulsion. This is where cold fermentation occurs in which the oxygen, become more passive, combines with carbones which produce a growth-promoting effect. The outer water's turbulence clears the core water of its silt, and receives from this trace elements and nutrients. Through longitudinal vortexing matter is brought through "extreme densation" into a physical condition of emulsion rendered possible by high states of ionization, enhancing the generation of levitational energies. The energies are then released on a plane perpendicular to the axis of the vortex.
- Transverse vortices, which operate at right angles to the banks, are generated by layers of water moving at different speeds. These mix the water, and at the same time cool it, distributing the lighter weight sediment from the center to the river bank. They act as a break, slowing the river down. The uppermost vortex train manifests as the backward-breaking ripples seen on the rivers' surface.
- Vertical vortices directed toward the river bed. These act in destructive ways in energetic terms. Here oxygen is heated. (see figure 11)

We can look more closely at how the longitudinal vortex takes place in a healthy river's core waters. Let us envision the scenario of a shaded side and a sunny side of the river. The factor influencing the formation of bends is the difference of temperature due to the fact that on one side the water is more shaded and therefore cooler. When it is exposed to the sun (right side from top to bottom) it becomes more turbulent and decelerates compared to the core-water. The water flowing on the opposite, shaded bank, which is cooler and faster overtakes the slower moving water and curls around it toward the right, eventually creating a bend. The colder water removes sediment on the side it approaches, while on the other side sediment is deposited. Where the colder water flows the channel grows deeper.

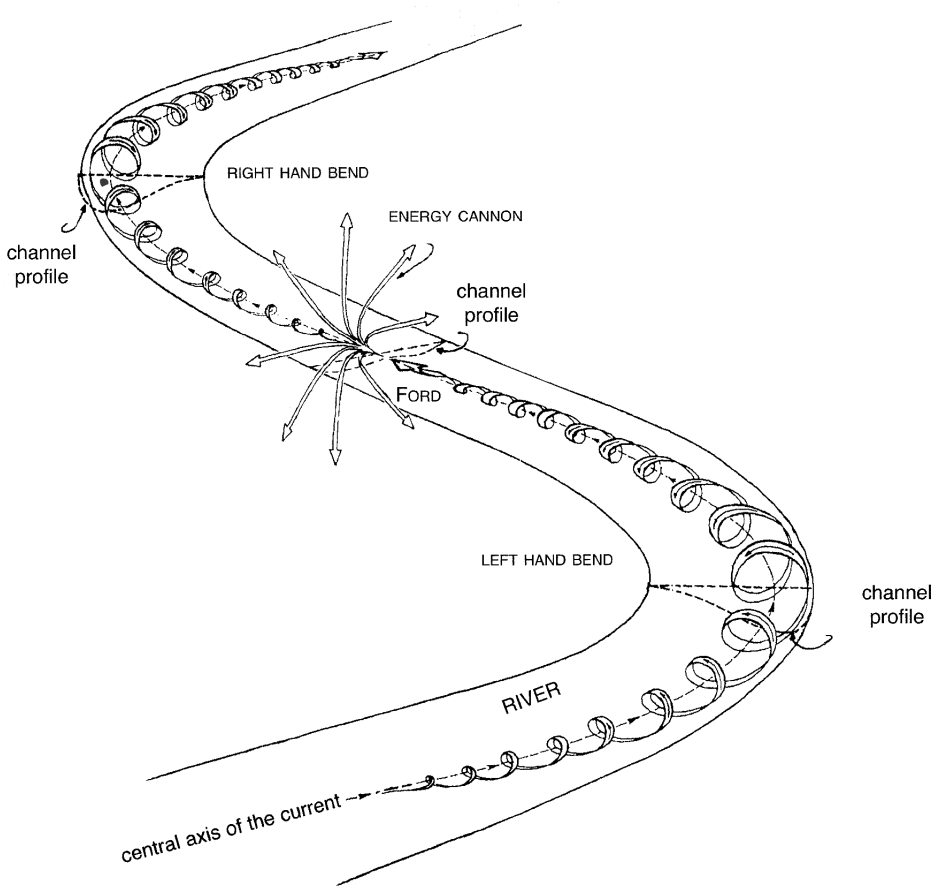

Figure 11: Currents and generation of energy in river beds

The cold water will end up flowing on the opposite side of the channel (shaded side) leading to the formation of a bend in the opposite direction to the first, the whole forming the familiar pulsating rhythm. At the bends rocks and stones are ground down, delivering what Schauberger called the "river bread" with vital nutrients moving into the groundwater table or into the main longitudinal vortical flow, as long as there is a positive temperature gradient. If the water is cold there will be release of ionizing energy which leads to phenomena of triboluminescence produced by the rubbing of crystalline stones of similar composition.

Through longitudinal vortexing matter becomes denser and levitational energies are produced. The energies released when water cools off and the oxygen becomes passive, are released on a plane perpendicular to the axis of the vortex.

Where the core water starts oscillating from one side to the other the speed of flow tends to decrease; this is where the river is shallower and fords are formed. In the bends rocks and stones are ground up and carried along. At

the ford not only solid matter but also upbuilding, levitational energy is released into the environment; this is what Schauberger calls the "water cannon."

Overall the water in the river first moves into a bend with increasing energy, then it exits from it to come to a standstill, where the energy cannon arises; on the other side it exits in the contrary direction to start the process again in mirror fashion. All of this resembles what we know of the stirring of a volume of water containing horn manure or horn silica (BD 500 0r 501), first in one direction, then in another. The great process of Nature's alchemy is replicated in small through the alchemy devised by Rudolf Steiner.

Technological versus Holistic Water Regulation

River regulation purports to improve the use of flowing water for navigation, for protection of riverbanks against flooding and rupture, use of drinking water or production of energy through reservoirs and hydroelectric power. Basic modern river regulation practices aim at bringing water into its fastest flow through the landscape and at letting it drain as quickly as possible. To do this it modifies/straightens the course of the river and stabilizes it with artificial structures, through canalization and bank-correction, or eventually dredging its sediments. Add to this dams and reservoirs. Basically these measures correct Nature without understanding it. By correcting the consequences rather than the causes they lead to compounded problems. The waterways are much better and more cheaply regulated through the temperature gradient, its own engine of motion and driver, than through the bends, which are only the consequence of this motion.

By the time Schauberger pointed to these problems, practically all major rivers in Europe and North America had undergone a technologically approached change of their course. The control of the Danube, as of 1931, engulfed considerable sums of money. The waterworks in the upper and middle parts of its course had already rendered unproductive almost a million hectares of farmland, periodically flooded. In Serbia whole villages had to be evacuated.[30] Schauberger, deeply involved in the consultations, even if on the margins, devoted time and energy to the two main European arteries, Rhine and Danube, but to no avail. The following is an example among the many from the Rhine. Upstream of Mannheim the meanders of the Rhine were straightened and made to flow in a V-shaped channel of uniform cross-section. The course of the river was shortened by ½ over what are presently about 20 kilometers. This means that the river is no longer able to transport its sediment and the bed has to be constantly dredged. Through this and other similar works the Rhine was robbed of its specific character and vitality, because water is prevented from creating differentials of temperature—it is artificially kept at uniform temperature—

[30] Viktor Schauberger, Callum Coats editor, *The Water Wizard*, 1710-71.

and no cooling can take place through longitudinal vortices. Transverse and vertically aligned vortices will prevail. A negative temperature gradient becomes the almost constant norm, and the sediments are no longer ground, nor beneficial energies released. The oxygen becomes active and aggressive and pathogenic bacteria thrive. Having nowhere else to go the water becomes more aggressive in times of floods. Multiply this phenomena over most of the course of the Rhine and you will have a fuller impact of modern hydraulics on the matter of river regulation.

The disastrous results of modern watercourse regulation come from only taking into account mechanical factors and neglecting the reality of the patterns of flow in naturally regulated rivers in which the temperature gradient plays a paramount role. Problems in water courses are exacerbated because water is made to flow in ways that are not natural to it, resulting in negative temperature gradients, acceleration of the flow, erosion of the banks, lowering of the tractive/carrying capacity of the waters which is optimal when close to the boundary layer, etc.

The above is all the more so when this completely technological approach ignores the roles of forests and lakes in the stabilization of rivers. The shading and the cooling effect that accompanies the evaporation created by the presence of forests would facilitate the emergence of a permanent positive temperature gradient. With this the river would flow more naturally and easily remove and transport sediments in the core waters at its center.

Lakes, on the other hand, create a delaying effect on rainwater discharge. Where forests and lakes are missing, then properly operated artificial reservoirs are important, even essential. Here lies another aggravating factor: most modern dams create conditions for purely sterile water which does not recharge the groundwater and causes additional problems downstream. Add to these the problems caused by the heating and lower quality water created by electrical turbines, an issue little acknowledged to this day. The waters exiting the turbines lose all their structure, heat up and become rich in oxygen, which becomes very aggressive in the river's path downstream.

<u>Reducing danger of flooding</u>
Flooding is more likely to happen in negative temperature gradient stretches of the river. To prevent it we must recreate a positive gradient or extend its duration. This can be done in at least four ways:

- Replanting of trees on the riverbank with tree species with a high evaporation rate to increase refrigeration. The belt should be of 500 to 1000 meters (1650' to 3300') wide.
- Because of modern river regulation dams are needed in order to prevent the constantly accelerating movement of water due to the straightening of the riverbeds. If warmer water is discharged from

the top of the dam this will encourage flooding. If too much colder water is drawn from the bottom of the dam this may cause excessive scouring and transport of heavy sediments causing problems downstream. In addition "cold pollution" can cause havoc to the fish population. Modern dams suffer like their river counterparts, from ignoring the effects of negative temperature gradients which encourage hot temperatures at the center of the wall, and jeopardize their structural soundness through phenomena of cavitation—formation of empty spaces in the solid structure. Schauberger designed simple but ingenious patents for drawing the right temperature water from the reservoir, temperatures that obviously vary according to the time of the year. One of his patents creates a second skin on the inner side of the dam, in whose gap water is drawn in from different horizons in summer and winter. In both instances this favors a positive temperature gradient toward the dam wall, protecting it from overheating. He also designed special dam profiles and devices for letting water flow over the surface of the dam in order to reduce the contrasts of temperature and preserve the soundness and longevity of the dam, still an alarmingly great problem with modern dams.[31] This second measure is only temporary; after six months to a year the structure of the dam is completely sealed and it is no longer exposed to structural dangers.

- Installing flow-deflecting guides that direct the water at the bends toward the center, imparting a spiraling movement, and creating cooling longitudinal vortices—anti-clockwise on left-hand bends, clockwise on right-hand bends. The flow-guides are an elaboration and refinement of the slats Schauberger placed in the log-flumes. They consist of a precast concrete flow-form. The curved surface is fluted with grooves running parallel to the direction of flow. The wider, upstream side of the triangle is horizontal and flush with the riverbed. It directs the waters in such a way that they curl over centripetally, giving rise to a longitudinal vortex in the center of the channel. In other words it is possible to recreate artificially the longitudinal spiraling movement that happens naturally in meandering rivers. An added advantage of the flow guides is to gather the dissolved carbones and direct them toward the center to mix with the oxygen which in healthy streams collects in the central axis. The carbones are energized when moved centripetally. The oxygen is rendered more passive by the negative temperature gradient.

[31] To measure the impact of river management on dams, see the list of catastrophes, which would be perfectly avoidable, at https://www.worldatlas.com/articles/the-deadliest-dam-failures-in-history.html and https://en.wikipedia.org/wiki/Dam_failure#List_of_major_dam_failures. Because rivers are regulated in ways that accelerate their flow and destructiveness, reservoirs are necessary. But because the influences of temperature on the structural longevity of dams are ignored, dams and reservoirs become an added liability.

- Implanting energy bodies in the stream, anchoring them to the river bed. They are egg-shaped bodies of same density as the water, which create longitudinal vortices. Whereas flow-guides are used at the bends, the energy bodies are placed in the straighter parts of the watercourse.

Water Mains

In the use of domestic water Schauberger devised a type of main which not only better preserves water quality; it enhances it. Its novelty consists in bringing the planetary motion that water can acquire in log flumes or in newly regulated rivers down into the structure of a wooden water pipe. In the old times wood was commonly used. Ancient Romans used wooden pipes or conduits of natural stone. Wood was still in vogue in Europe before the Industrial Revolution and even in New York.[32] Wooden mains were manufactured by the Australian Wood Pipe Company around 1910 with good results; They were tested by the USDA (Bulletin # 376) which vouched for their durability and better water conduction than cast iron pipe.[33]

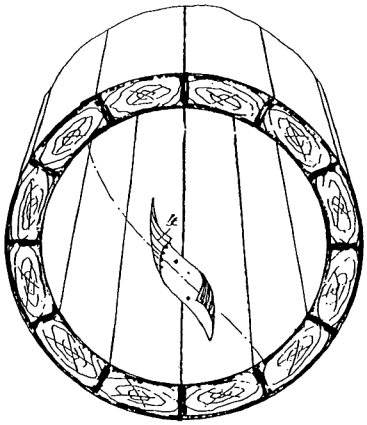

Figure 12: Section of a water main designed by Viktor Schauberger

In normal mains the structure of water deteriorates due to friction and turbulent flow, which decompose the dissolved trace elements. Carbonic acid is removed, and this leads to a deterioration of the vitality of the water. To address these issues Schauberger designed a pipe made of wooden staves—in essence like a miniature barrel. Inside the pipes were silver plated copper guide vanes similar in principle to those of the flumes or of river bends (see figure 12). Provided the system be embedded in sand, to provide a breathing membrane, and the pipes be protected from light and heat, it will outlast steel pipes. Wood will not deteriorate if it's not exposed

[32] Alick Bartholomew, *Hidden Nature:* 157.
[33] Viktor Schauberger, Callum Coats editor, *The Energy Evolution*, 93.

to the light. Mind you, this is true of naturally grown wood, resonant wood, not the wood of commercial plantations. More about this will be added in the next chapter.

The guide vanes in the pipes change the movement of the core water to a vortical longitudinal one, whereas along the walls a secondary vortical movement occurs that takes place across the section. Hence the name which Schauberger occasionally gave the system, "double-spiral-flow pipes."

With this kind of pipe subtle energies are enhanced, friction and deposition on the inner wall are reduced, while the flow is accelerated which has an added cooling effect. The oxygen transferred to the pipe walls helps control pathogenic bacteria which thrive with lack of oxygen. Vortical motion enhances levitational forces and generates tractive force—the capacity to remove particles in suspension (see figure 13).

The circulation process is dynamic and evolves over time, at least at the beginning. With the cooling occurring in the middle core, some solid particles are directed to the periphery, where they will contribute to seal the wood surface in such a way that the wood becomes even more durable than iron.

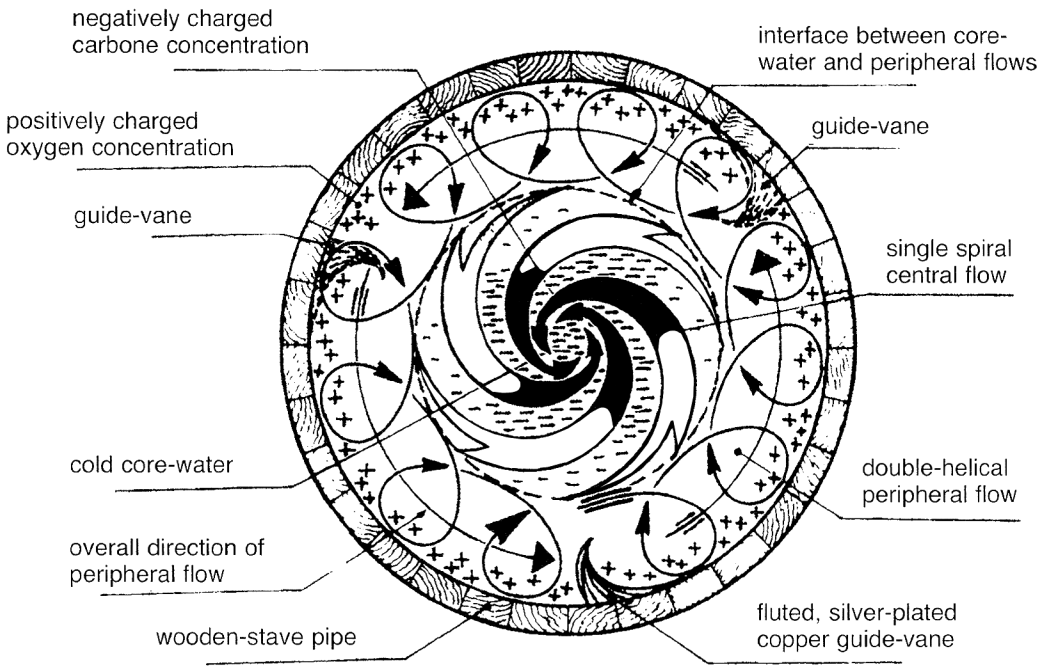

Figure 13: Flow dynamics of the water main designed by Schauberger

As an added bonus the water circulates faster than in regular kind of pipes and increases in quality, whereas in a regular pipe the water loses quality with the distance of transport. Part of the process of quality build-up is due to the cooling process in the core water due to gases evolving from the carbones formed in the flow axis, in higher concentration than in the periphery. Oxygen acts in reverse to the carbone gases, concentrating towards the wall of the pipe which is warmer. Over time the processes reach an equilibrium point; the wood cures becoming more and more resistant to external influences, further promoting water's health.

Understanding of the importance of the temperature gradient and of the kinds of motion in water has led us to the realization that all of Nature is alchemy, or the movement between energy and matter and back to energy. At the level of the seed, nascent matter shows us how energy transforms matter, witness the experiments of von Herzeele and Hauschka. At the end of the cycle, when the tree raises matter up the trunk, the substances are more and more refined and transmute into energy as we will see next. Homeopathic, or rather bio-dynamic, processes are everywhere at work in Nature and deliver health to plants and environment and through these to the human being. If we humans can recover the wonder to which Nature calls us, and think "an octave higher" we then will realize that planet Earth is not a closed system, and that abundance and health derive from making recourse to other processes than those to which we routinely turn; to move from explosion engines and mechanistic thinking to new technologies and truly living thinking. Armed with the understanding of motion and temperature gradients we can now understand what happens in forestry and farming and how these, together with the rivers, influence the global cycle of water and the climate.

Once we understand even the simple interplay of temperature gradient and water motion we have access to simple means of generating practically free energy. Here follows one example of Schauberger's innovations.

Generation of Energy from Sea Water

The knowledge of the importance of the temperature gradient and water's chemical composition can be used for energy generation purposes in the most basic way through solely mechanical effects in exploiting the rising of sea-water from the depths of the ocean and its expansion through its recharge with oxygen. Waters from the depths have minimal oxygen content since this has been used up by fish and other life-forms.[34] The water at the $+4^0$C layer, not exposed to light and heat and under conditions of great pressure is unable to absorb gases. For the purpose of generating electricity from the motion of water Schauberger makes recourse to a very long shaft, plunging into the sea water, and connected above water to a specially designed centripetal impeller (rather than a conventional

[34] The whole process is explained in more detail by Callum Coats (Callum Coats, *Living* Energies, 136-38).

centrifugal impeller), coupled to an electric generator. At an empirically determined depth—that of the + 4 ^{0}C boundary layer—the water in the shaft receives through side conduits fitted with a one-way diffusing filter an inflow of oxygen (see figure 14). The oxygen absorption will cause both warming and expansion. The pipes will be designed in such a way that through vortex-inducing vanes, similar in concept to those the inventor used in the log flumes, the water will expand and rise in a planetary motion.

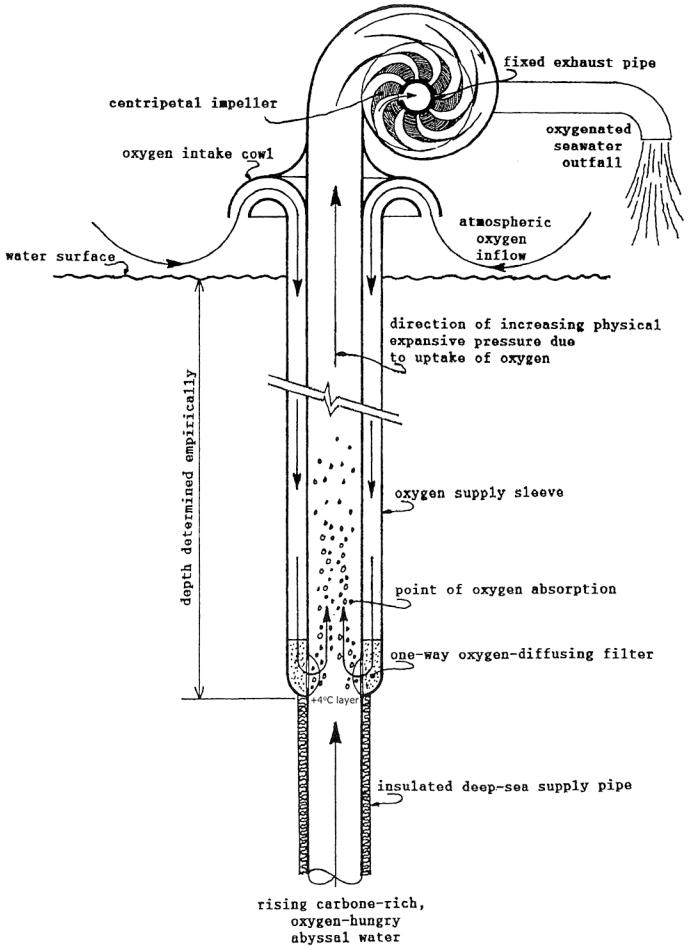

Figure 14: Generating power from sea water

The rising water moves the impeller and sets the generator in motion for the production of energy. The generation of energy can be afforded for truly negligible investments when compared to conventional generation of hydroelectric energy. The end-product, oxygenated sea-water is harmless to the environment. Of all the energy generation mechanisms devised by Schauberger this is the simplest, but it already announces a theme: if water or air can be treated according to natural motion and with an understanding of the temperature gradient, then a kind of energy can be created in ways that do not generate entropy and whose end-products are ennobled forms

of the base materials, rather than degenerated, polluting forms. This is a "virtuous cycle" rather than the vicious cycle of fighting Nature with combustion processes which do not occur naturally other than in breakthrough mechanisms, but in much milder forms.

With knowledge of the ideas we have explored Schauberger offered remediation for waterways, simple ways to improve water quality and avoid all the problems that modern hydraulics hardly knows how to approach. The reason behind this is the lack of appropriate understanding of temperature gradients and motion.