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Short Communication



# The Socio-hydrological Cycle Between Origin and Transience

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## Abstract

The connection between water and life on our earth is inextricable. Water is the key substance for sustaining life and most of the body consists of water . The earliest traces of human civilization were found in remains of prehistoric settlements on the edge of rivers and lakes. The importance of water for humans goes far beyond the physical, chemical and biological properties of this polar covalent molecule. The polarizing presence of water is evident in every phase of human life. Water connects and separates, water protects and destroys. It keeps alive and it drowns, it fascinates and it frightens. Water symbolizes origin and transience.

**Keywords:** Hydrology; Phenomenology; Religious philosophies; Sociology; Water cycles

## Introduction

A river can be seen as the classic archetype of a water stream. According to national geographic a river is a ribbon-like body of water that flows downhill from the force of gravity. A smaller stream of water is called creek or brook. Some rivers flow year-round, while others flow only during certain seasons or when there has been a lot of rain [1].

Socio-hydrology is a new scientific discipline that considers people as an endogenous part of the water cycle [2]. People interact in multiple ways including water for drinking and for sanitation, water for irrigation, agriculture and livestock farming, water for energy production and power plant cooling, water for transport, water for industry and technology, and water for waste disposal, just to mention some of the intended uses. In this context, socio-hydrology can be defined as fundamental science focusing on observation, understanding and prediction of socio-hydrologic phenomena in the co-evolution of humans and water [2]. Of course, this goes far beyond the historical framework and it also includes the philosophical and spiritual areas.

In classical mythology the running water of a river symbolizes the flow of time and transience. The unstoppable flow of time and the finiteness of being underlines how valuable the individual moment is. Therefore, we better seize the day [related to the Latin phrase "carpe diem" from the Odes and Epodes of the Roman poet Quintus Horatius Flaccus, approximately 23 BC]. From mythological point of view, a calm stream of water often stands for peaceful progress, fertility and serenity, but this image has contrastive properties. A raging river may be untenable, leaving behind destruction and suffering. The flow of water in a river sometimes is compared as metaphor to the passing of life. In the poem "Fear" by Khalil Gibran

one can read: "The river cannot go back. Nobody can go back. To go back is impossible in existence" [3]. This also reflects the course of every single life. There is a predetermined direction of progression and limited time that follows the notice that everything circulates [related to everything flows, pánta rheî (πάντα ῥεῖ) attributed to the Greek philosopher Heraklit, approximately 500 BC]. There is an eternal cycle between creation and decay. In this pictorial reflection I would like to point out the similarities in the flow of water and the emergence of consciousness as a common overarching socio-hydrological cycle.

## Discussion

### The cycle of water

The hydrological cycle is powered by the radiation of the sun with the river as part of the superficial appearance. Water evaporates from the surface of the earth and forms into clouds. Solar radiation also causes warming and expansion of air, thus creating wind that causes dispersal by blowing the clouds overland. When condensation occurs from cooling of the air, precipitation in the form of raindrops or hailstones brings water back to the surface of the earth that seeps into the soil. On places with waterproof layers the water comes back to the surface, thus creating a source. The emergent water forms a trickle that gets bigger and bigger due to numerous inflows of other trickles. The trickle enlarges to a brook that gets bigger and bigger due to numerous inflows of other brooks. The brook enlarges to a creek that gets bigger and bigger due to numerous inflows of other creeks. Finally, a large stream of flowing water results from the inflow of numerous affluent streams along its course. The river like a central leaf vein more or less maintains its dimensions between leaf apex (source) and leaf stalk (mouth). The permanent inflow of water from the source keeps the river flowing and replaces the water that disappears into the ocean.

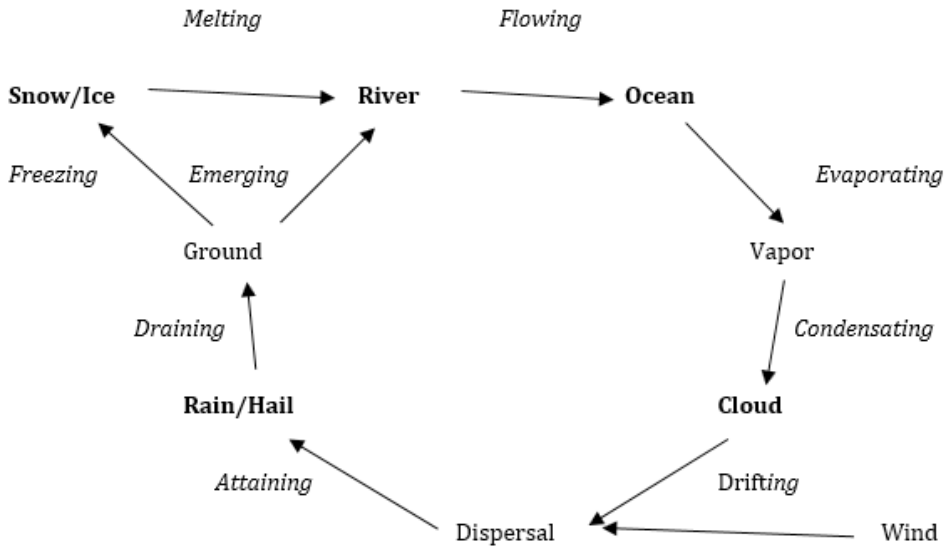


**Figure 1:** The hydrological cycle between the different aggregate states and movements of water

There are at least three different states of aggregation of water namely liquid (rain, river, ocean), gaseous (vapor, cloud) and solid (hail, ice, snow) in this simplified hydrological cycle. The chemical substance with the identical molecular formula ($H_2O$) appears in different physical states. There is a hypothetical fourth state of water described as liquid-crystalline phase by switching from a solute to a solvent perspective [4, 5]. In quantum mechanics, tunneling water describes the state of water at low temperatures when oxygen and hydrogen atoms of the water molecule present in six symmetrically equivalent positions in the channel at the same time [6]. In the basic state of the hydrogen atom, the alignment of the spin between electron and proton is not predetermined, but the spin is always aligned in opposite directions between electron and proton with the same probability. There is always an indeterminacy of the states of the entangled subsystems before measurement and the dependent correlations between the related observations. After the measurement in the magnetic field, the state of the hydrogen atom is a different, non-entangled state, which results from the superposition of the two entangled states. Such considerations in quantum mechanics are worrying and are difficult for us to imagine [7].

In his poem "Fear" Khalil Gibran interpreted the estuarine behavior of the river before entering the ocean as trembling with fear. It is the fear from disappearing forever into the ocean. The fear subsides not until the river has understood that he does not vanish into the ocean. Instead of perishing he is becoming something great and immense, something incredible vast. The river is becoming the ocean, just as Khahil expresses in his verse: "For life and death are

one, even as the river and the sea are one“ [8]. In contrast to the river there is no clearly defined beginning and no defined end in the hydrological cycle. Water flows to the sea and evaporates, fresh water arises from the sources and keeps the endless flow of water going. In this eternal cycle the occurrence of new existence and extinction is harmonically balanced. Nothing is lost in this natural equilibrium. There is no final goal either in this cycle. The start and finish are everywhere and nowhere at the same time. That's why the journey can be the destination.

## The cycle of consciousness

Although defined as a stream of flowing water a river is rather a phenomenon [derived from the ancient Greek word "pheinomenon" (φαινόμενον) in the meaning of appearance], than an object. Looking at a river you see the water that is transported by the river. When you touch the river you touch the water that makes the body of the river. Without water there is only the empty river-bed but the river per se is not the water. Without flow there is only dammed water but the river is not the flow of the water either. A river is the phenomenon of flowing water, but a river per se is neither flow nor water. Similar, consciousness depends on a physical body and a spiritual mind but consciousness is neither body nor mind. Consciousness is a phenomenon too.

The uncountable number of water drops flowing in a river is comparable in dimension to the uncountable number of thoughts attending an uncountable number of living beings during an uncountable number of lives. There is a permanent flow of thoughts prior to acquiring knowledge and accessing knowledge. However, the river-bed of thoughts may shift. There is no sharp distinction between the movement of the water on the river-bed and the shift of the bed itself [9]. On the one hand, the flow of thoughts is not distinct of the context of thoughts. On the other hand, a permanent flow of thoughts does not necessarily provide knowledge and knowledge per se is not an imperative for wisdom. Knowledge is accumulated information, obtained through education or experience. Without context, knowledge has little value. There is a smooth transition from information to knowledge and from knowledge to understanding.

Knowledge substantially differs from wisdom. While the ability to retain knowledge is linked to intelligence, wisdom requires understanding. Understanding is the ability to comprehend context. Understanding context is far beyond the understanding of words within their context. To detect the main message out of a sequence of words is to understand the meaning. When attempting to understand the context it is important to realize what the background of the information is. More than reading the words it is rather the ability to read between the lines. Understanding context is an essential preposition of human communication. Consequently, wisdom is profound understanding at a deeper level. While knowledge can be passed on by means of words or symbols, understanding is not conceptual and cannot be passed on [10]. Understanding is based on the individual cognition following critical analysis. The difference between "to know" and "to be certain" is of little importance unless when used in certain domains (e.g. at the court of law) where "I know" should be identical in meaning with „I can't be wrong" [9]. Accordingly, Wittgenstein concludes: "What I know, is what I believe" [9]. This also comes into play in the blurred boundary between scientific knowledge and scientific belief.

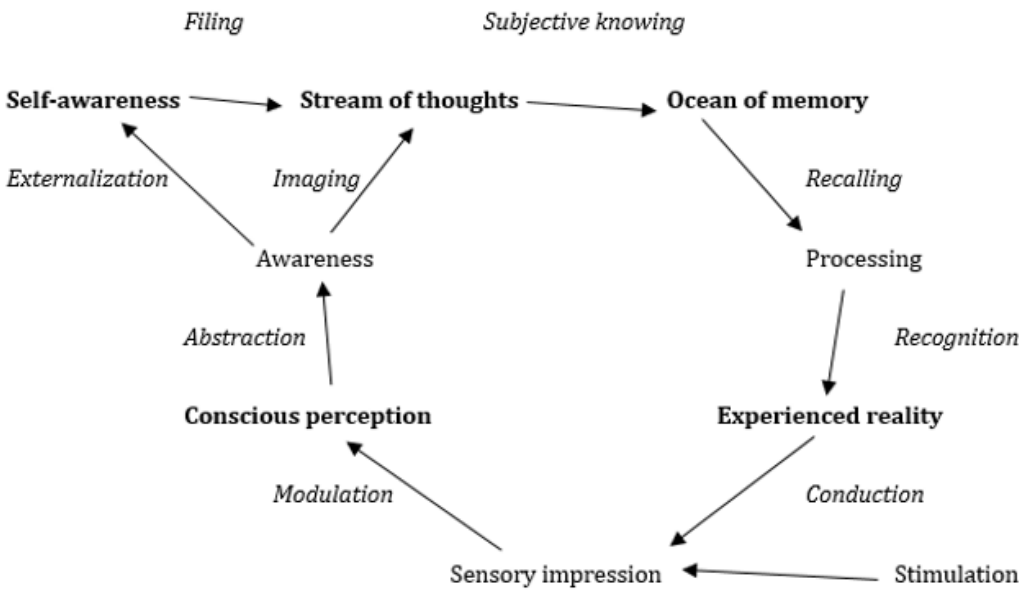


**Figure 2:** Cycle of consciousness between the experienced reality and the transitional states of awareness.

Similar to the hydrological cycle there is a cycle of consciousness. In this cycle the river is comparable to a stream of thoughts while the ocean resembles an unimaginably large reservoir of memory. Evaporation from the surface stands for recall of abstracted patterns while condensation stands for generation of the experienced reality. In this model the cloud formation indicates the experienced reality as a disembodied construct of a real physical environment. Multiple sensory impressions from stimulations are comparable with the cloud shift to different areas over land creating the diversity of perception. This ultimately prepares the basis for conscious perception. Consciousness has the highest impact in areas where anticipation, abstract thinking and phantasy contrast the physical environment like raindrops falling on dry soil in a desert or hailstones that devastate a crop field. Expectations and consequences change the observed perspective of our environment. We can observe water that initiates life in abundance for a limited time in a specific area. We also know about water that temporarily destroys living nature in a certain region. Seeing consciousness as chimera between perception and mind then both perception and thinking are selective. Not all impulses that act on our body have an effect on sensor stimulation and not all sensory inputs that affect us are actually perceived. The intensity with which sensations are experienced depends on momentary attention and expectation of an individual being. The way we perceive ourselves influences the countless thoughts of our mind, which in their entirety determine the world we experience and recognize. There is a common structure between the phenomena of flowing water and consciousness, corresponding to an overarching socio-hydrological cycle.

## Conclusion

What we can learn from the river is that there is a clearly predetermined direction of progression. The river cannot go back. Decisions can be abandoned in many cases but the fact that a certain decision has been made at a certain time cannot be undone. We also can learn that the very situation cannot be brought back in its complete circumstances. In any case the tardiness and serenity of a big river puts this sobriety into perspective. The ability to experience progression and time is a question of memory. Without memory there is no past and without speculative imagination there is no future. Our interaction with the physical, social and spiritual environment is bound to the moment. Rather than getting lost in thoughtful reflection of events in the past or anxiously expecting events in the future, we better seize the day. We only have the moment.

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## Conflict of interests

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