

speech: that, organically speaking, human words contain a certain fluidity, an overall sense of flowing, with water in the consonants. This fluidity incites us to a special psychic state, a disposition which fills our minds with images of water.

The flow of water evokes a fluid, ambiguous space, which is capable of dissolving borders and transcending limits, as well as giving rise to new forms and perceptions which do not cease to surprise us and change our outlook. In the depths of water, we are connected with the creative forces of art, one specific manifestation of human creativity which, in turn, "can be seen as the unique expression of an essential trait in all levels of nature" (Ilya Prigogine). Beyond our human condition, water brings us face to face with all life. It reminds us of our inextricable links with the amoeba and the great oak, with a tiny ant, a dog or a whale. And voyaging even further in its depths, water reminds us of the repercussions of a storm in a tea-cup, a simmering saucepan, the dynamics of waves, cloud formation, fluctuations on the international stock exchange, traffic chaos, migratory flows and the currents of collective behavior. These have their respective social and psychological factors, which echo in the far-off waters of intuition, in the substance of dreams and the deep currents of the individual and collective subconscious; as such, they influence us, and even shape the way we are.

In its horizontal state, water tends towards movement and dialogue. Constantly flowing, it resists lying stagnant and conforming to limits. Indeed, it strives to overcome borders, and filter into all things and all places. From a social point of view, this permeability and transversal nature inspires us to interrelate, and to question our egocentric attitude as regards the 'other'. Water calls into question the mechanistic, deterministic models of Newtonian physics, whose principle of separating subject and object have increasingly distanced mankind from nature.

In this respect, water is a key player in the serious ecological crisis which now affects us all. Over the coming decades, if not right now, the threats to the world's waterways will be one of the greatest challenges facing mankind. The pollution of rivers and seas, the rapid spread of desert areas, the so-called water wars and global warming are all issues which must be tackled without delay.

There is an urgent need to tackle the complex factors behind these issues with commitment and widespread participation. This does not only mean implementing the "right" environmental policies and plans for water management based on the latest technology (although such projects are of course necessary). "The greatest ecological problem is not industrialization, the hole in the ozone layer, overpopulation or the depletion of the planet's natural resources. The main problem is the lack of understanding and mutual agreement as regards how to tackle these problems" (Ken Wilber). For the sake of the world's water, awareness of these issues must be raised and action taken. The future of our water requires us to overcome egocentric and ethnocentric philosophies and behavior. Only from a global perspective will we be able to understand the extent of the problems and take effective action. The real problem resides in the fact that thinking and acting on a global scale requires a profound transformation in outlook. This is perhaps the greatest challenge.

Water, then, is strangely ambiguous. On the one hand, it is a fundamental resource whose increasing scarcity and pollution

will cause serious problems in the most diverse areas and contexts. On the other hand, water could inspire us to develop a new kind of ethics, based on peaceful coexistence and respect for our own substance and fluidity; an ethics which transcends creeds and ideologies, based on respect for difference, which sees the 'other' not as a threat but as a valuable opportunity for enrichment and learning.

This calls for a transversal space in which art, science and philosophy all converge. It requires considerable changes in the way we perceive our diverse, ever-changing reality; a reality in which we all take part, or which is a part of us all.

In this process, art's potential for inspiration make it a catalyst for real experience, as well as helping to formulate a broad, interdisciplinary outlook capable of drawing together both scientific research and poetic intuition.

Far from being conclusive, this project celebrating water aims to promote dialogue; it is therefore open, fluid and tentative. It is an invitation to navigate through a wide range of different ideas, concepts, data, experiences, senses, images and texts, from a variety of diverse sources. Rather than providing answers, it aims to pose questions related to water, in the widest sense of the word.

Lisbon with its World Exhibition is the perfect setting for us to look and/or see ourselves in the liquid mirror. And, perhaps, to stop and listen to the sound of our own transience. Like water, time passes quickly, and waits for no one: "over and over, it will repeat some fine, time-worn word, flowing over stones." (Gaston Bachelard).



## WATER AND SKY

ILYA PRIGOGINE

For Thales, water was the primordial element, and all other states derived from its transformations. We may smile at this idea today, but it was the basis for a unified vision of nature, for a search which has lasted until our own era. As J. Wahl [1] writes: "In one of the dialogues, Plato writes that the first wise men were Homer and Hesiod, and he points out that these poets were partisans of universal development. For Homer, the ocean was the father of all things. This philosophy of evolution was formulated theoretically for the first time in Heraclitus' system. We also know of Leonardo Da Vinci's fascination with water, which he expressed in his strange drawings of whirlpools devouring cities."

I like to watch the play of the waves that break onto the beach: their coming and going makes me dream. Each wave is formed of millions and millions of molecules. It is the result of a supramolecular coherence, an unpredictable game. At what moment will the wave break? At what moment will those complicated movements begin to interfere? No one can be certain.

What would we think of the world if man were a "marine mammal"? I am convinced that the description of the world and

the phases of knowledge of this "marine mammal" would be completely different from the earth-bound creatures that we are.

Modern science originated in observing the sky. Man has always been fascinated by periodicity, but what must be remembered is that planets and stars move in a void. We can isolate the celestial bodies. We can discuss the relation between two bodies (such as Earth-Sun) or among three bodies (such as Earth-Sun-Jupiter). These observations of the sky provided the starting point for the classic laws of nature formulated by Galileo, Kepler and Newton, with their determinist descriptions and the affirmation of an equivalence between past and future.

If man were a "marine mammal", the description of nature would be completely different: the void would be replaced by fullness. In addition, in order to describe this fullness it is necessary to abandon the classic Newtonian laws, bearing in mind water's resistance to movement: it is necessary to speak of entropy and turbulence. It would no longer be possible for phenomenology to reject the difference between past and future, a temptation to which classic science succumbed. Instead of the problem of two bodies, man as "marine mammal" would be confronted by collective phenomena. Irreversibility and randomness would be the starting points for describing nature. The possibility of simplified schematic situations, such as those of two or three bodies, would only be cleared up progressively.

These conclusions curiously coincide with the vision offered us during the last few decades by the science of disequilibrium. The physics of complete domination of nature, situations of equilibrium, determinist descriptions — these are the exceptions. What better illustration of these conclusions than the physics of water? Water is never in a state of equilibrium. It exists as a molecular formation because of the hydrogen bridges that unite the water molecules. These formations are in a constant process of transition. Water is a unique substance. It leads us to the current scientific paradigms concerning concepts of disequilibrium, irreversibility and randomness.

I am pleased to form a part of this celebration of water during the 1998 Universal Exhibition in Lisbon. We might even state that water transcends the opposition between permanence and movement. When one looks at the sea, one feels two sensations: that of being before something that has been eternally present since the origin of life, and that of incessant and renewed movement. What better symbol for our society in transition, in search of a form of coexistence between the custody of the cultural treasures of the past and the need for moving the world toward a renovation that might strengthen human dignity?

#### NOTES

In "Agua", published by the magazine *Atlántica*, in conjunction with the 1998 Universal Exhibition in Lisbon.

[1] Wahl, Jean: *Traité de Métaphysique*. Payot, Paris, 1963.



## THE PASSAGES OF WATER

KLAUS LANZ

*Thalassos. Oceanus. Moana nui. Il mare. The sea.*  
Vast. Limitless. Depths beyond imagination. Bright and dark. Division and connection. Enemy and provider. Depending on perspective, the ocean may represent the ultimate obstacle or eternal promise.

Despite centuries of seafaring, tales and poetry, science and measurement, the ocean's true nature still escapes the human mind. Even today, in the age of instant global communication and space travel, we know surprisingly little of the inner workings of these immense bodies of water. A most striking example is the Gulf Stream, that massive marine river pushing warm water from the Gulf of Mexico into the North Atlantic. Scientists understand now that this flow of heat saves Scandinavia despite its high latitude from the fate of a Siberian climate. But no-one can explain what exactly regulates this water movement or predict how this delicate Atlantic heater will react to changes in climate.

Another marine mystery has been christened El Niño: an extraordinary warming of surface water in the south-eastern Pacific, it turns global weather patterns upside down, causing floods in dry regions like Sudan and Kenya and bringing drought to Indonesian rainforests by altering monsoon pathways. The ocean turns out to be an organism, with its different seas connected and listening to each other. An organism with veins of currents carrying the sun's warmth from tropical seas to temperate latitudes and nutrients from coasts to the high seas.

The oceans also charge the winds that blow across their surface with moisture, extending their reach into the terrestrial third of the earth. Together with the sun's rays, marine moisture carried across the continents is the most important regulator of the land's heat budget. It brings cool relief to parched fields, it melts ice and snow after long winter months. Without atmospheric moisture, the sun's desert heat and the space cold of an arctic night would render the earth as uninhabitable as the moon.

### THE CHALLENGE OF THE LAND

Where the water in the oceans comes from is an ancient question. And why there is little or no water on the moon and on the other planets of our solar system. Scientists are still debating whether the water in the primeval oceans was formed by a chemical reaction from hydrogen and oxygen formerly bound in rocks, or whether the earth has been bombarded (and still is) with millions of ice meteors from outer space, over aeons filling the lower parts of the earth's surface with water.

Little doubt is left that life was born in the oceans. And that it evolved there for hundreds of millions of years before the first life forms dared to establish their place on land. In fact, while the greening of coastal wetlands and estuaries commenced with the first primitive plants, life in the ocean had already

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