

Meandering River Resource Rights

Irene J. Klaver

Introduction

As we set out to explore philosophical foundations of territorial rights over river resources, let us ask this question: Can river resource rights meander? That is to say, can we find in the geomorphology of a meandering river a useful analogy for thinking about complex issues?

The River Meander (Anatolia, Turkey) once formed a crucial conduit for Mediterranean trade and traffic between Europe, North Africa, and Asia. At its mouth sat the foremost Aegean port city Miletus, acclaimed for the origins of Greek philosophy and science. Historians Herodotus and Strabo mention the Meander's winding ways, which were so striking that "meander" came to mean riverine sinuosity and to stand for anything twisting and curving. It even became the name for an ornamental pattern. However, while the word carved itself deep into the cultural imagination, the river slipped out of that imagination. The Meander River – the Büyük Menderes River nowadays – is, outside Turkey, a little-known river; the fact that the word and phenomena of meandering refer to a real existing river is all but forgotten.

The geomorphological process of meandering is as intricate, twisting, and turning as the curving Meander River. A meandering river takes time while it covers a broad area, scouring the hardest rock, depositing the quickest sands. It is deeply spatial, temporal, and specific – continually finding its trajectory, while making it. It is profoundly responsive to the lay of the land, the nature of the climate, the character of human interventions, and a multitude of other vectors. In fact, so many factors and processes are at play that there is, as yet, no precise explanation as to why and how rivers meander. Neither is there a conclusive standardization in the description of meanders: a variety of scientific symbols, parameters, theories, models and schemes are employed.

Symbolically and metaphorically, meandering conveys the nature of the sinuous; it bespeaks the often-unpredictable movements of coming and going, the curving back and forth. The emergence and fading of the Meander River in the cultural imagination can itself be seen as a meandering: an appearance and disappearance of the very river that left its indelible mark on human culture by giving its name to the process in which it disappeared again. The self-referential character intensifies the complexity of the process.

Linearity has become the privileged paradigm of progress, its leading model of efficiency. In the modern imagination meandering has a negative connotation. The straight line signifies progress, an arrow moving forward and upward over time, symbolizing growth and improvement through controlling nature. Its concomitant mindset is goal-oriented or teleological. Seen from this perspective, meandering has become a metaphor for aimless wandering, ambling along a winding path, or rambling through a longwinded argument. Convoluted and seemingly undirected, meandering is seen as not just the opposite of the efficiency of ‘streamlined’ operations—but as being in the way of efficiency.

However, many human practices develop in sinuous ways: learning through mistakes, honing a skill, experience built up over time in a never-ending process. Furthermore, most systems are nonlinear and unstable in nature. In the course of the second half of the 20th century this became widely accepted in the sciences – including physics, mathematics, and engineering. Indeed, study of the weather played an important role in the development of nonlinear dynamics. Miniscule changes in one part of a weather system can have complex effects throughout the system, which makes accurate long-term weather forecasting impossible, at least with current modeling techniques. Chaos theory, and non-deterministic as well as stochastic non-linear modeling became the state of the art in many fields, including research into the behavior of large-scale natural or social systems in ecology, economy and politics. Chaos is not the same as randomness; rather, it means that change produces complex effects that are not exactly predictable. Analyses of both practices and systems highlight the importance of field-dependency, of a larger context. A growing awareness of these dynamics opened the door towards a widespread

acceptance of complexity in the cultural imagination and, as I explore here, a revaluation of meandering.

Valuing meandering will have a train of effects on various concepts and practices. It facilitates a different way of thinking about efficiency, acknowledging that it might be more efficient to take more time and explore various possibilities, just as a river meanders through a basin. Meandering privileges exploration: a messy process, with stumbling, learning from failures, following contingent relations, a going back and forth. Exploration drives innovation, more than control does. Meandering foregrounds the searching in the notion of re-search. It invokes a model of engineering in terms of ingenuity, a bricolage and tinkering that acknowledges and interacts with various kinds of knowledge and expertise, that is capable of adjusting itself to local situations and demands, instead of simply following the straight lines of rule-driven reasoning. Meandering resonates with the ancient Greek notion of cunning intelligence, *mêtis*, in its sense of resourcefulness, practical effectiveness and experiential wisdom.

Meandering implies a very different sense of efficiency and progress--it allows for a re-thinking of progress through complexity rather than through linear order. Meandering invokes, elucidates, and hints at another practice, a different way of knowledge, another mindset, a different imagination, and a cultural and political framework that diversifies what counts as expertise, progress and efficiency.

Meandering does not allow for simple analyses or reductionist geo-political frameworks. Meandering connects flows of words with flows of water and flows of power, bringing the social, technological, and natural together in a moving pattern of on-going political deliberation, doing justice to the rich social-cultural history of the region. It bespeaks the political and social necessity of going back and forth, taking time to explore the terrain, to elucidate attributes, relations, problems, and solutions, as a gateway to new constructs of imagination, to a capacity to aspire.

The philosophical investigation of river resource rights calls for a mosaic of writings – multifarious, with a wealth of cultural traditions, ecosystems, and intricately layered events, stories, and histories. I set this conceptual model into motion, allowing the discrete tiles of a mosaic to show their overlapping entanglements, their changing configurations over past and future.

The Meander River meandering

The Meander River, currently the Büyük Menderes River in southwestern Turkey, courses through the southwestern part of what the Greeks called Anatolia and the Romans, Asia Minor. The Greek *Ανατολή*, like the Latin terms “Levant” or “Orient,” means the "East" or literally "sunrise." Originating in southern Phrygia, now west-central Turkey, the river flows west to the Aegean Sea, where Miletus, the southernmost of the Ionian cities, was the major harbor.

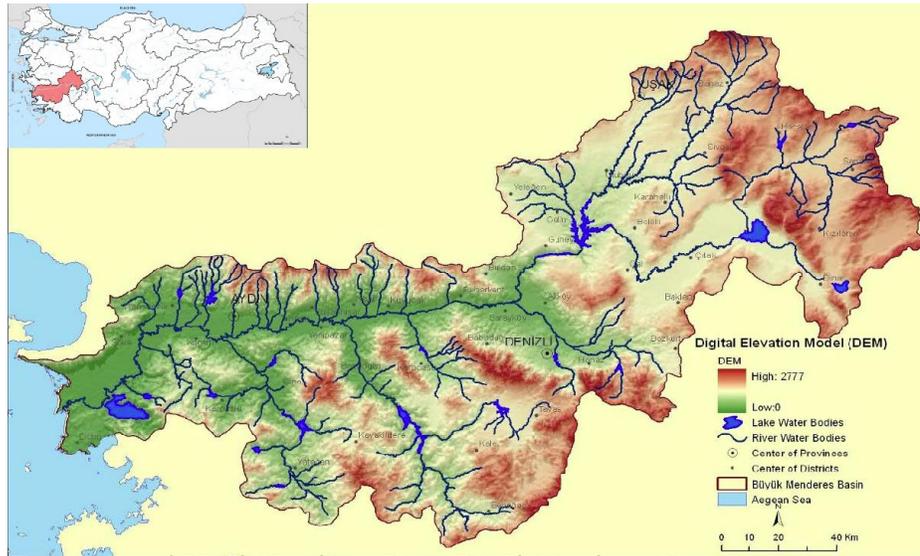


Fig. 1: Map of Büyük Menderes River. Büyük Menderes River Basin Management Plan, T.R. Ministry of Environment & Forestry, 2011.

It is a rather short river (584 km long), with a relatively small modern-day population in its basin of 2.4 million. It is a predominantly rural area, with agricultural production of cotton, figs, olives, and chestnuts, and animal husbandry of cattle, sheep, and goats (Fig. 1).

The earliest mentions of the Meander are found in Homer and Hesiod between approximately 750 and 650 BC. The tradition of Homer has deep Ionian roots and Hesiod's ancestries are from the western coast of Asia Minor. Hesiod gives a mythological account of how the river is named after one of the sons of the Titans Oceanos and Tethys: *Μαίανδρος* (Maíandros), a name variously rendered as Maeandrus, Maeander or Meander... "And Tethys bore to Ocean eddying rivers, Nilus, and Alpheus, and deep-swirling (...) Strymon, and Meander, and the fair stream of Ister" (Hesiod 1914: 337ff.).

Homer mentions the Meander in his historical and geographical account in the Iliad. After the main characters from the Greek force are introduced, a catalog of the Trojan troops follows, including: "And Nastes again led the Carians, uncouth of speech, who held Miletus and the mountain of Phthires, dense with its leafage, and the streams of Maeander, and the steep crests of Mycale." (Homer 1924: 870). The expression "uncouth of speech" is revealing: those Carians from Miletus and the Meander valley are rude, foul-mouthed, ill-mannered and uncultured. In Greek it is expressed in the single word: *barbaroi* (*βαρβαροφώνων*), literally, the "non-Greek speaking," that is, they are the "others," which clearly implies, inferior.

Not long after the accounts of Hesiod and Homer, the Greeks settled the Ionian Coast including the Meander Delta. The Meander valley became a vital trading route for Mediterranean and Asian goods. One might call this the first meandering of the Meander River in the cultural imagination. After the negative portrayal of the river in Homer, it became the precious gateway to the east: "vast caravans of wood, wheat and spices, marble and ivory" followed its course, as Seal (2012: 11-12) notes in his well-researched Meander River travelogue.



Fig. 2: M. Pouqueville, "milet et cours du Meandre", Paris: Firmin Didot frères, 1835. Personal copy of lithograph.

Not only traded goods, but also armies traveled the basin. The city at the headwaters of the Meander River, Dinar (Celaenae in the fifth century BC), was of strategic importance: its pass formed the gateway between east and west. Xerxes' Persians headed west in 481 BC to conquer the Greeks and Alexander the Great (from Macedonia) headed east to conquer the Persians 150 year later. These classic power shifts between the East and the West kept meandering along the river that gave the process the name.

Near the Meander's mouth on the Aegean Sea was the prosperous port of Miletus, the southernmost of the Ionian Cities. In the course of the sixth and fifth centuries BC it was a cultural center, booming and bustling with celebrated musicians, poets, engineers, mapmakers, and philosophers such as Thales, Anaximander, and Anaximenes (Fig. 2). Aristotle called Thales of Miletus the first Greek philosopher, no longer a theologian like

the old poets, but the founder of natural philosophy. For our exploration of river rights we should note that Thales considered water to be the beginning, an originating and guiding principle or *archê*.



Fig. 3: Photograph of statue "Achelous" by Simon Mariere, 1684-88, by Vincent Torri, Wikimedia, 2011.



Figure 4: Photograph of statue Fortuna, Roman copy of Greek original; Fortuna rielaborazione romana da originale greco del IV secolo ac., Museo Chiaramonti. Photograph by Sailko (Wikimedia pseudonym), Wikimedia, 2010.

Water is crucial for food production. Like many rivers, the Meander provided excellent conditions for agriculture, a great advantage for the traffic of military and merchants. Its valley was a valuable hinterland for the city, providing a steady food supply. River gods (*potamoi*) were often represented holding a cornucopia, a horn of plenty, the symbol for providing abundance, and bringing bounty. Fortuna (Tyche in Greek), one of their sisters, often carried a cornucopia too. As the goddess of chance, fate or even capriciousness, unpredictability, changeability, she could bring many goods. Or withhold them. Similarly

the river could give and take. In the cultural imagination rivers and fate occupied a similar position (Fig. 3 and 4).

The very same agricultural development that had been so advantageous for the Meander Valley traffic enhanced erosion and silt formation in the Meander River basin. In another meandering of history, Miletus became a landlocked town. Over the centuries, the Miletus Bay silted up with alluvial deposits from the very river that had had made it important. The economy of the once-prominent harbor city collapsed. Nowadays, the ruins of the city lie some 10 km from the Aegean Sea (Fig. 5).

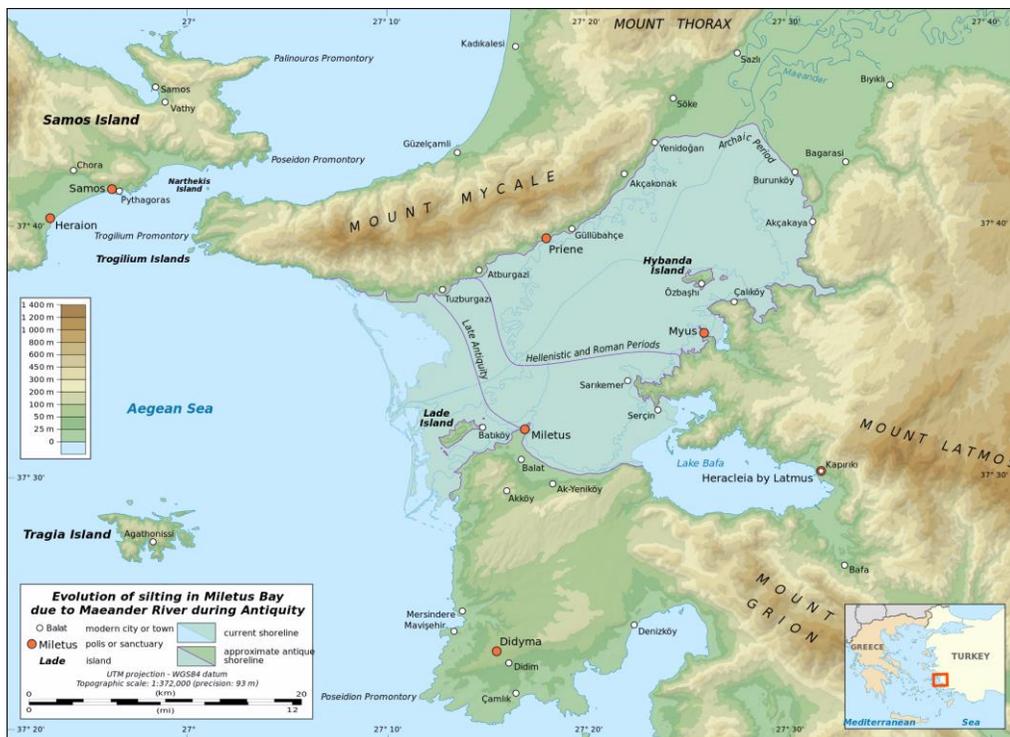


Fig. 5: Miletus Bay silting evolution map, Eric Gaba, Wikimedia, 2009.

Strabo and Le Corbusier's Law of the Meander

Two thousand years ago Strabo, in his *Geography*, described the course of the Meander at its beginning as an easy-going stream, then becoming a large river flowing through Phrygia, then forming the boundary between Caria and Lydia. At this point the Meander is so crooked [σκολιότητας – rendered by Hamilton & Falconer in 1903 as “torturous” and by Jones in 1923 as “exceedingly winding”] that everything that is winding is now called “meander.” Strabo was the first to explicitly indicate the metaphoric force of the Meander River. The ambivalence of the phenomenon is expressed in the different translations of *scolios*, varying from sheer descriptive to evaluative: “torturous.” Even if the word *scolios* might have been a neutral description of the phenomenon, the river did not acquire any glorious or pleasant adjective. Over time *scoliosis* became the name for a medical condition, a deformity of the spine, where it no longer follows a straight line but looks like a “?” or an “S.” *Scoliosis* is something in need of correction, definitely when pain is involved. Strabo's *scolios* cast a long shadow over meandering rivers.

For centuries the meandering of rivers has been associated with something to be straightened out, often in the name of efficiency. At the same time meandering kept capturing the cultural imagination. Even *the* architect of the straight line, Le Corbusier, was fascinated by meanders. So far did his fascination go that he ‘discovered’ the Law of Meander, which ultimately straightened the curves once again.

In 1929 Le Corbusier was invited on the inaugural flight of the South American Aviation Company from Buenos Aires to Asuncion in Paraguay in a tiny ten-seater plane. The co-pilot was no less than Antoine de Saint-Exupéry, the author of *The Little Prince*. Le Corbusier was fascinated by the delta of the Parana River, one of the major rivers in the world, at the confluence with the Paraguay River. He marveled at the very geomorphology of the meandering rivers and took the meandering as a metaphor for human thinking. He suddenly realized that wandering and changing often underlie human creative thinking, human dealing with the problems of life as it is lived in the real world. "Following the outlines of a meander from above, I understood the difficulties met in

human affairs, the dead ends in which they get stuck and the apparently miraculous solutions that suddenly resolve apparently inextricable situations" (Le Corbusier 1991: 4). He constructed a Law of the Meander that largely concerned itself with “breaking through” or stratifying the meander, rather than having the structure and experience of meandering inform “knowing how.” Despite his fascination with the form, Le Corbusier’s Law of the Meander privileged the straight over the sinuous (Fig. 6).

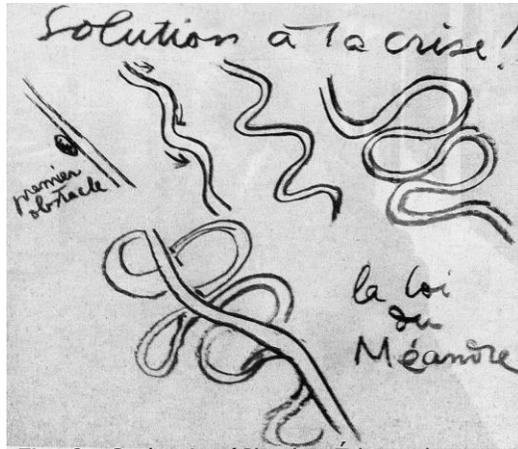


Fig. 6: Corbusier (Charles-Édouard Jeanneret-Gris), adapted from sketch for *la loi du Méandre*, 1929: 142.

Meandering and Metis

The very twisting and wandering character for which meandering became so well known bespeaks a way of thinking long ignored, belittled, even considered counter-productive, precisely because it connotes complexity and multiplicity instead of unity. In its polymorph character, adjusting itself to the circumstances, meandering is structurally comparable to the ancient Greek notion of applied or real-world intelligence, *mêtis*, conveying a similar sense of resourcefulness and practical effectiveness.

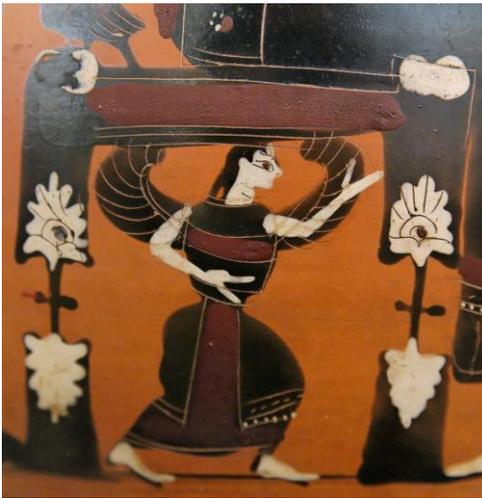


Fig. 10: Winged goddess thought to be Metis, in a scene depicting the birth of Athena. Detail on black-figure amphora from 550-525 BC in the collection of the Louvre. Photograph by Marie-Lan Nguyen.

In Greek mythology Metis (*Μῆτις*) was a female deity, daughter of Oceanus and the first spouse of Zeus. She represented wisdom, skill, craft, and cunning—a highly praised combination. Zeus fearing her powers and her offspring, swallowed her, but she had already conceived Athena, who was born fully armed from his forehead. Metis symbolized cunning intelligence in politics, practice-based knowledge in military art and medicine, the skills of the artisan crafts; all these forms of experiential wisdom were called *mêtis*.

(Fig. 10).

In their masterful work, *Cunning Intelligence in Greek Culture and Society*, Detienne and Vernant argue that *mêtis* is “at the heart of the Greek mental world in the interplay of social and intellectual customs where its influence is sometimes all-pervasive” (1978: 3). However, despite its pervasiveness, *mêtis* is never explicitly thematised or analysed. While there are many treatises about logic, there are none about *mêtis*. The intellectual world of Greek philosophy, in contrast to the everyday mental world, was a dualistic world with a radical dichotomy between being and becoming, the intelligible and sensible, the unchanging one and unstable multiple. In this framework of thought there

was no place for *mêtis*, which “is characterised precisely by the way it operates by continuously oscillating between two opposite poles.” (1978: 5).

Odysseus is celebrated as the wily cunning, the *πολύμητις*, the one of many counsels, (literal translation: *πολύ* “many” *μητις* “*mêtis*”). But the nature of his cunning, or of the skills of a craftsman, the problem-solving of a detective, the art of making a good joke, even the “Eureka moment,” went largely unexamined for centuries. *Mêtis*, often defined tersely as “craft, skill, and experiential wisdom” came to stand for knowing *how*, for the palette of abilities outside the logical, goal-directed, static ways of knowing of *logos*.

Mêtis escapes simple definition--it “always appears more or less below the surface, immersed as it were in practical operations” (1978: 3). Its way of knowing, its kind of intelligence and “its field of application is the world of movement, of multiplicity and of ambiguity. It bears on fluid situations which are constantly changing and which at every moment combine contrary features and forces that are opposed to each other” (1978: 20).

“The essential features of *mêtis* ...--pliability and polymorphism, duplicity and equivocality, inversion and reversal—imply certain qualities which are also attributed to the curve, to what is pliable and twisted, to what is oblique and ambiguous as opposed to what is straight, direct, rigid and equivocal” (1978: 46). Detienne and Vernant mention explicitly the term *skoliós* in this context, as one of the adjectives indicating curving, frequently used to describe *mêtis*; the same term Strabo used to describe meandering.

Meandering through Solution Space

The Meander confounded early lawyers concerned with boundaries and scientists concerned with the mechanisms of meandering streams. Meander symbolized irregularity, complexity, ambiguity, and instability. In the latter part of the twentieth century precisely these ‘meandering’ qualities brought out the value of multiple perspectives in arts and sciences; the weak ontology of becoming became as valuable as the traditionally more privileged strong ontology of being; the inductive, analogical, and emergent as valuable as control and generalizability (O’Connor & Copeland 2003: 99).

The understanding of probability and complexity provided new forms of explanation and new ways to operate even within fields long founded on “ideal” characteristics and laws. The meander came to be seen as an irregular waveform, at once subject to and generating random processes and forms.

Similarly, recent writers have begun to characterize emergent and analogical thinking. These characterizations of ingenuity bear deep resemblance to the *mêtis* of antiquity. Dreyfus speaks of *expertise* in terms of “intuition [that] is the product of deep situational involvement and recognition of similarity” and notes: “how experience-based holistic recognition of similarity produces deep situational understanding.”(1986: 29, 32) Similar concepts characterize modern ingenuity and engineering design: explicitly pragmatic; contingent; visual in character; satisficing; messy; holistic; whimsical; learning from failure (O’Connor & Copeland 2003:104).

Hapgood describes the first phase of engineering design as a “metaphorical traversal through solution space,” in which “failure, imagination, and stuckness” are at play. The traversal and design process is “idiographic and unpredictable” and often beset with “painful trials or iterations.” For Hapgood the engineer is a “tinkerer who engages in activities within an artistic and subjective context” (Hapgood 1993: 96). O’Connor and Wyatt use the term “thinkering” to blend Hapgood’s tinkering together with Dreyfus’s deep situational involvement into “engineering discovery by doing” (O’Connor & Wyatt 2004: 12).

“Allowing the mind to wander aids creativity,” asserts science journalist Kaplan in his report on recent research by psychologists Baird and Schooler. Their study suggests that “simply taking a break does not bring on inspiration – rather, creativity is fostered by tasks that allow the mind to wander” (Kaplan 2012).

So we see *mêtis* acknowledged as a set of habits of expertise and the Meander holding its metaphorical power for today.

Conclusion: Re-meandering

In, a so-called “feat of reverse-engineering” a research team at the University of California at Berkeley built a scale model of a living meandering gravel-bed river in their lab. It was the first successful model ever. A National Science Foundation report notes: “Stream restoration is an extremely complex and delicate science. Because there is no formula to create meandering streams. Successful stream restorers almost require a sixth sense to get everything right and set a sustainable environment into motion, and not every restored stream lasts” (Deretsky 2009).

Re-meandering has become a popular practice in ecological restoration, even in places where there never were meanders. Rivers are resurfacing in the public imagination as cultural and ecological corridors, creating a cultural rejuvenation around urban renewal projects. In many rural areas river restoration is underway: the re-meandering of watercourses and restoring of floodplains are being carried out by many of the same engineering firms that straightened the waterways in the early or mid-twentieth century. New management regimes are seeking to work with, not against, rivers.

Meandering is never finished – not even in the delta where the river and the sea meet and co-create the sweet-salt interface, an extremely fertile ecosystem. As Leonardo da Vinci stated: “In rivers, the water that you touch is the last of what has passed and the first of that which comes....” (Cremante 2005: 246). The river keeps flowing. A river is never finished. It is part of a large system of tributaries, groundwater flows, evaporation and precipitation flows. The term “hydrological cycle” suggests too simple a process.

Meandering continues to have metaphorical and illustrative power, not just for classicists or hydrologists. In the early 21st century it is a notion of importance for describing complex phenomena. The British Broadcasting Corporation used “meandering” extensively to indicate the phenomenon of the Jet stream, elucidating the major dips in the jet stream caused by changes in differential pressures encountered by the stream; it is used neither pejoratively nor positively, it just *is* (Ghosh 2014).

Meandering is dependent on the complex interaction of many material vectors. It is a symbol for how power operates in the everyday, lateral traversing, picking up material and depositing, re-activating in the process. Meandering stands for an ethics of adjustment, a politics of engagement, enabling and on-going deliberation, a sense of experiment: tinkering, thinking, emergent and transient. Meander brings the social, political, technological and natural together in an ongoing dynamic. The Law of the Meander is not the straight line but the sinuous back and forth, symbolized linguistically by the little preface 're-', the notion of the again and again, not as a Phoenix emerging from the ashes, completely burnt, but in the sense of honing a skill, the experience one gets in *mêtis*, the exploration through wandering, the essay in Montaigne's original sense of trial and attempt.

Meandering is a slower process than the straight line of progress, covering more ground, percolating into deeper depths, listening to the murmurs of more voices. Meandering makes room for what cannot be measured, what does not want to be measured, for the slow: slow food, slow movement, slow design, for the workings of the material realm not ruled by the structures of scheduled time.

The Meander River no longer functions as a Mediterranean thoroughfare, but the notion of meandering to which it gave rise, has endured, and has re-emerged as valuable. Meandering is not a symbol for closure but one of ongoing change and exchange, of identities that shift over time. As Stuart Hall wrote: "Cultural identities come from somewhere. But, like everything which is historical, they undergo constant transformation. Far from being eternally fixed in some essentialised past, they are subject to the continuous 'play' of history, culture and power" (1994: 396).

Meandering can be of pertinence for understanding the mosaic of issues describing river resource rights. With quality of life and even life itself at stake around river resources, meandering privileges ways of examining and proceeding that do justice to the specificities of Stuart Hall's continuous 'play' of history, culture and power. Meandering is a metaphor for the ongoing necessity of debate and negotiation in politics, a metaphor

bespeaks *mêtis*, the shape-shifting intelligence, which enables us to aspire to a complex future.

Acknowledgements

I want to thank Brian C. O'Connor for his close readings and suggestions.

Works cited

Boyer, C. (2003), Aviation and the Aerial View: Le Corbusier's Spatial Transformations in the 1930s and 1940s, *Diacritics*, 33(3/4): 93-116.

Cremante, S. (2005), *Leonardo da Vinci: Artista scienziato inventore*, Florence: Giunti Editore.

Damasio, A. (2012), *Self Comes to Mind, Constructing the Conscious Mind*, New York: Vintage Books.

Detienne, M. & Vernant, J-P., Lloyd, J. (translator) (1978), *Cunning Intelligence in Greek Culture and Society*, Chicago: University of Chicago Press.

Dreyfus, H. & Dreyfus, S. (1986), *Mind over Machine, The Power of Human Intuition and Expertise in the Age of the Computer*, Oxford: Basil Blackwell.

Deretsky Z. (2009), National Science Foundation http://www.nsf.gov/news/news_summ.jsp?org=NSF&cntn_id=115660&preview=false, accessed 02/04/2014.

Fraser V. (2000), Cannibalizing Le Corbusier: The MES Gardens of Roberto Burle Marx, *Journal of the Society of Architectural Historians*, 59 (2): 180-193.

Gimbutas, M. (1995), *Die Sprache der Göttin*, Frankfurt: Zweitausendeins, image 38.

Ghosh, P. (2014), Wavier jet stream 'may drive weather shift'. *BBC News: Science & Environment*, 15 February 2014, accessed 2.19.2014 <http://www.bbc.com/news/science-environment-26023166>

Hall, S. (1994), Cultural Identity and Diaspora. In *Colonial Discourse and Post-colonial Theory: a Reader*: 392-401. Williams, P. & Chrisman, L. (eds.) London: Harvester Wheatsheaf. 1994.

Hapgood, F. (1993), *Up the Infinite Corridor, MIT and the Technical Imagination*, Reading, MA: Addison-Wesley.

Hesiod. (1914), The Theogony: lines 337-370. In Evelyn-White, H. *Hesiod, The Homeric Hymns and Homerica*, Cambridge, MA: Harvard University Press; London: William

Heinemann Ltd., <http://data.perseus.org/citations/urn:cts:greekLit:tlg0020.tlg001.perseus-eng1:337>, accessed 01/07/2014.

Homer. (1924), *The Iliad*. In *The Iliad with an English Translation*, Murray, A., Cambridge, MA: Harvard University Press; London: William Heinemann, Ltd., <http://data.perseus.org/citations/urn:cts:greekLit:tlg0012.tlg001.perseus-eng1:2.858>, accessed 01/06/2014.

Kaplan, M. (2012), Why great ideas come when you aren't trying, *Nature*, online, <http://www.nature.com/news/why-great-ideas-come-when-you-aren-t-trying-1.10678>, accessed 02/02/2014.

Klaver, I. (2013), Environment Imagination Situation. In: Rozzi, R., Pickett, S., Armesto, J., Palmer, C. & Callicott, J. (eds.) *Linking Ecology And Ethics For A Changing World: Values, Philosophy, and Action*: 85-105, Dordrecht, the Netherlands: Springer Press.

Le Corbusier, Schreiber Aujame, E. (trans.) (1991), *Precisions on the Present State of Architecture and City Planning*, Cambridge, MA: The MIT Press. Originally published as *Précisions sur un état présent de l'architecture et de l'urbanisme*, Paris: Crès, 1930.

Leonardo da Vinci, Richter, J.P. & Bell, R.C. (trans.) (1970), *The notebooks of Leonardo da Vinci*, New York, NY: Dover Publications.

O'Connor, B., Copeland, J. & Kearns, J. (2003), *Hunting and Gathering on the Information Savanna*, Lanham, MD: Scarecrow Press.

O'Connor, B. & Wyatt, R. (2004), *Photo Provocations, Thinking in, with, and about Photographs*, Lanham, MD: Scarecrow Press.

Rajagopal, A. (2014), 'The Little Prince' and Le Corbusier, *Metropolis Magazine*, <http://www.metropolismag.com/Point-of-View/January-2014/Le-Corbusier-and-the-Little-Prince/>, accessed 12/28/2013.

Reissmann, E. (2012), The Origin of the Meander, *blogmymaze*: <http://blogmymaze.wordpress.com/2012/05/20/the-origin-of-the-meander/>, accessed 2/4/2014.

Seal, J. (2012), *Meander: East to West, Indirectly, Along a Turkish River*. New York: Bloomsbury USA.

Strabo. (1877), *Geographica*, Meineke, Leipzig: Teubner, <http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.01.0197> accessed 01/16/2014.

Strab. 12.8.15 Strabo. ed. H. L. Jones, *The Geography of Strabo*. Cambridge, Mass.: Harvard University Press; London: William Heinemann, Ltd. 1924.

Yesil, N. (2011) Büyük Menderes River Basin Management Plan, *Joint DABLAS-Black Sea Commission Regional Meeting*, http://ec.europa.eu/environment/enlarg/dablas/pdf/22_06_2011/2.3.pdf, accessed 11/22/2013.