

Center for Environmental



Research at Hornsby Bend

MISSION

Urban Ecology and Sustainability

- Community
- Education
- Research



PARTNERS

- Austin Water Utility
- University of Texas
- Texas A&M University

RESEARCH AREAS

- Soil Ecology and Urban Waste Recycling
- Avian Ecology
- River and Alluvial Aquifer Hydrology
- Riparian Ecology











Center for Environmental Research at Hornsby Bend

2015 Austin Water - CER Lunchtime Lectures

The Geography of Rivers: The Nature and Culture of Flowing Water

Twice a month from NOON to 1pm

Waller Center - Room 104 625 East 10th Street

Dougherty Arts Center 1110 Barton Springs Road



Free and Open to the Public – bring a lunch and learn



Center for Environmental

Research at Hornsby Bend

Austin

The Geography of Rivers: The Nature and Culture of Flowing Water

The metaphor of the "round river" which flows back into itself provides the structure of the lectures.

The Culture of Flowing Water – January to April The Science of Fluvial Systems – May to August Waterways: Rivers of Culture – September to December





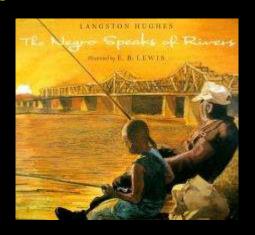
The Culture of Flowing Water – January to April

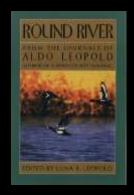
January 6 at Waller Center - The Round River: Myth, Meaning, and Flowing Water
January 21 at Dougherty Arts Center – The Round River: Myth, Meaning, and Flowing Water

February 3 at Waller Center – Riverrun: Language, Art, and Flowing Water February 11 at Dougherty Arts Center – Riverrun: Language, Art, and Flowing Water

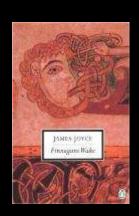
March 3 at Waller Center – Riversong: American Rivers and Music March 11 at Dougherty Arts Center – Riversong: American Rivers and Music

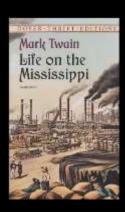
April 7 at Waller Center – Strong Brown God: the Poetry of Rivers
April 8 at Dougherty Arts Center – Strong Brown God: the Poetry of Rivers











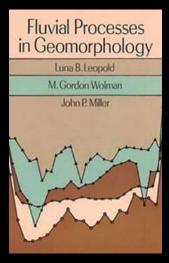


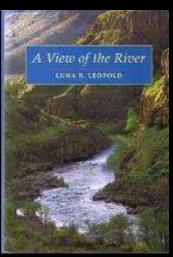
May 8 at Dougherty Arts Center – River Process: the Fluvial System and River Hydrology May 15 at City Hall - River Process: the Fluvial System and River Hydrology

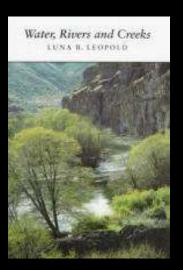
June 12 at Dougherty Arts Center – River Life: the Ecology of Flowing Water June 19 at City Hall - River Life: the Ecology of Flowing Water

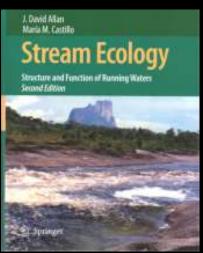
July 10 at Dougherty Arts Center – Riparia: Life at the River's Edge July 17 at City Hall - Riparia: Life at the River's Edge

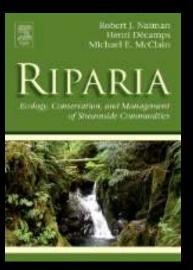
August 14 at Dougherty Arts Center – Bottomland: Floodplain Habitats August 21 at City Hall - Bottomland: Floodplain Habitats











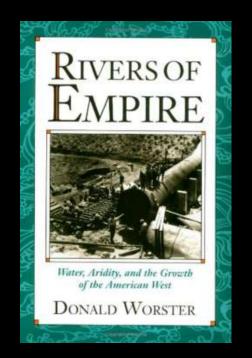
Waterways: Rivers of Culture – September to December

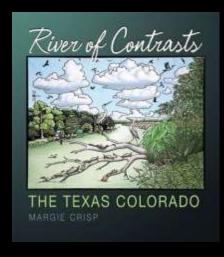
September 11 at Dougherty Arts Center – Rivers of Empire: American Rivers September 18 at City Hall - Rivers of Empire: American Rivers

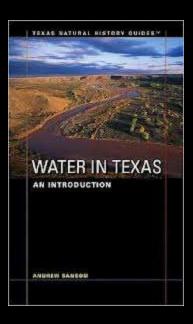
October 9 at Dougherty Arts Center – Waters the Land: Texas Rivers October 16 at City Hall - Waters the Land: Texas Rivers

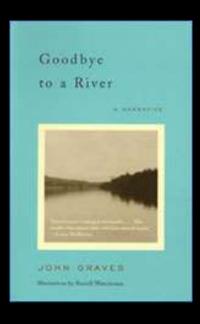
November 13 at Dougherty Arts Center – Another Colorado: Rivertown Austin November 20 at City Hall - Another Colorado: Rivertown Austin

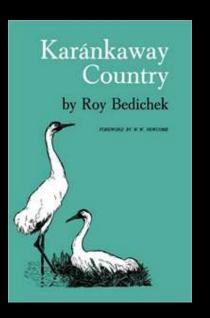
December 11 at Dougherty Arts Center – Goodbye to the River: A Summary December 18 at City Hall - Goodbye to the River: A Summary











Strong Brown God: The Poetry of Rivers

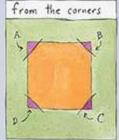
Kevin M. Anderson, Ph.D.

Austin Water - Center for Environmental Research

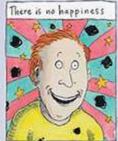








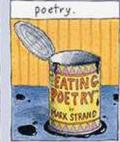














River Language

A Linguistic Journey

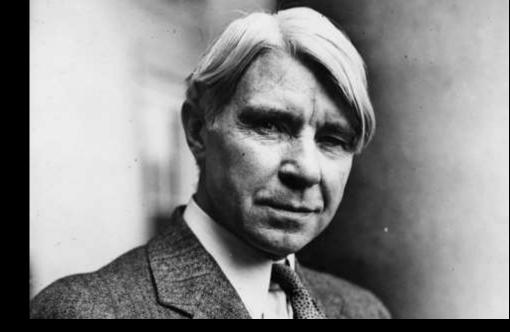


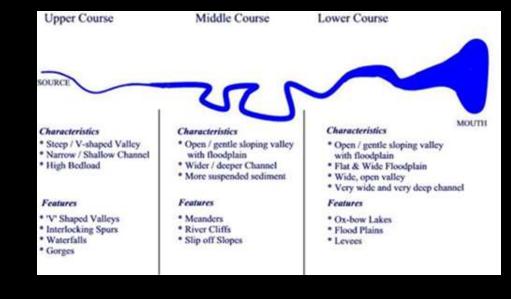
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Riverside	Aquifer	Downstream
Riparian	Floodplain	Upstream
Riverine	Erosion	Midstream
Bottomland	Aggrading	Fork
Shoal	Degrading	Hydraulic
Eddy	Downcutting	Terrace
Whirlpool	Reach	Flume
Bar	Channel	Gradient
Rapid	Drainage	Slope
Bank	Watershed	Gravel
Bed	Catchment	Gully
Riffle	Basin	Hydrological
Ripple	Sediment	Hyporheic
Bend	Branch	Thalweg
Pool	Stream	Sweep
Hole	Current	Sinuous
Bankful	Surface	Tributary
Snag	Submerge	Inflow
Backwater	Depth	Outflow
Alluvial	Sounding	Headwaters
Fan	Groundwater	Mouth
Braid	Surfacewater	Delta
Oxbow	Discharge	Estuary
Meander	Peak Flow	Flood

Carl Sandburg

Languages

There are no handles upon a language Whereby men take hold of it And mark it with signs for its remembrance. It is a river, this language, Once in a thousand years Breaking a new course Changing its way to the ocean. It is mountain effluvia Moving to valleys And from nation to nation Crossing borders and mixing. Languages die like rivers. Words wrapped round your tongue today And broken to shape of thought Between your teeth and lips speaking Now and today Shall be faded hieroglyphics Ten thousand years from now. Sing—and singing—remember Your song dies and changes And is not here to-morrow Any more than the wind Blowing ten thousand years ago.





River Moons Carl Sandburg

The double moon, one on the high backdrop of the west, one on the curve of the river face,

The sky moon of fire and the river moon of water, I am taking these home in a basket hung on an elbow, such a teeny-weeny elbow, in my head.

I saw them last night, a cradle moon, two horns of a moon, such an early hopeful moon, such a child's moon for all young hearts to make a picture of.

The river-I remember this like a picturethe river was the upper twist of a written question mark.

I know now it takes many many years to write a river, a twist of water asking a question.

And white stars moved when the moon moved and one red star kept burning, and the Big Dipper was almost overhead.



Len Steckler Monroe meets Sandburg December 1961



T.S. Eliot 1888-1965

Four Quartets

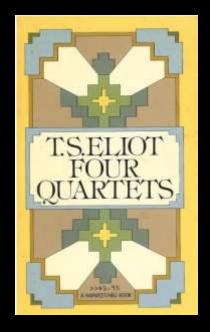
"The Dry Salvages"

I do not know much about gods; but I think that the river Is a strong brown god—sullen, untamed and intractable,

Patient to some degree, at first recognized as a frontier;
Useful, untrustworthy, as a conveyor of commerce;
Then only a problem confronting the builder of bridges.
The problem once solved, the brown god is almost forgotten
By the dwellers in cities—ever, however, implacable.
Keeping his seasons and rages, destroyer, reminder
Of what men choose to forget. Unhonored, unpropitiated
By worshippers of the machine, but waiting, watching and waiting.
His rhythm was present in the nursery bedroom,
In the rank ailanthus of the April dooryard,
In the smell of grapes on the autumn table,
And the evening circle in the winter gaslight.

The river is within us...







Greek Poetry and Rivers: Styx and Lethe

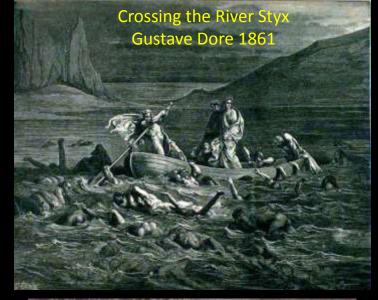
<u>Styx</u> - The Styx (also meaning "hate" and "detestation" adjectival form: Stygian) is a river in Greek mythology that formed the boundary between Earth and the Underworld (often called Hades which is also the name of this domain's ruler).

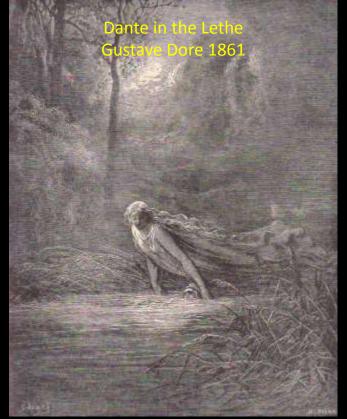
In order to cross the River Styx and reach Hades, a dead person must pay a fee to the ferryman, Charon. If the correct fee is paid, Charon will take the dead across. If the dead cannot afford the fee, however, they will be forced to wander the banks of the River Styx as Wraiths for eternity.

<u>Lethe</u> - In Greek mythology, Lethe was one of the five rivers of Hades. All those who drank from it experienced complete forgetfulness. Lethe was also the name of the Greek spirit of forgetfulness and oblivion, with whom the river was often identified.

In Classical Greek, the word *Lethe* literally means "oblivion", "forgetfulness", or "concealment". It is related to the Greek word for "truth", aletheia, meaning "un-forgetfulness" or "unconcealment".

Both rivers are part of the geography of Dante's *Divine Comedy*





Wallace Stevens 1879-1955

The River of Rivers in Connecticut

There is a great river this side of Stygia Before one comes to the first black cataracts And trees that lack the intelligence of trees.

In that river, far this side of Stygia,
The mere flowing of the water is a gayety,
Flashing and flashing in the sun. On its banks,

No shadow walks. The river is fateful, Like the last one. But there is no ferryman. He could not bend against its propelling force.

It is not to be seen beneath the appearances That tell of it. The steeple at Farmington Stands glistening and Haddam shines and sways.

It is the third commonness with light and air, A curriculum, a vigor, a local abstraction . . . Call it, one more, a river, an unnamed flowing,

Space-filled, reflecting the seasons, the folk-lore Of each of the senses; call it, again and again, The river that flows nowhere, like a sea.



Repose of Rivers

The willows carried a slow sound,
A sarabande the wind mowed on the mead.
I could never remember
That seething, steady leveling of the marshes
Till age had brought me to the sea.

Flags, weeds. And remembrance of steep alcoves Where cypresses shared the noon's Tyranny; they drew me into hades almost. And mammoth turtles climbing sulphur dreams Yielded, while sun-silt rippled them Asunder ...

How much I would have bartered! the black gorge And all the singular nestings in the hills Where beavers learn stitch and tooth. The pond I entered once and quickly fled—I remember now its singing willow rim.

And finally, in that memory all things nurse; After the city that I finally passed With scalding unguents spread and smoking darts The monsoon cut across the delta At gulf gates ... There, beyond the dykes

I heard wind flaking sapphire, like this summer, And willows could not hold more steady sound.



Hart Crane 1899–1932

The Myth of Orpheus

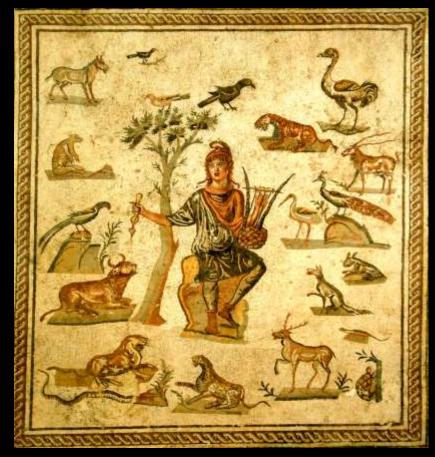
Orpheus was a legendary musician, poet, and prophet in ancient Greek religion and myth.

The major stories about him are centered on his ability to charm all living things with his music. But the love and loss of Eurydice and the death of Orpheus involves the passage over and into rivers.

Auguste Rodin Orpheus & Eurydice (1887)



Tree arising! O pure ascendance!
Orpheus Sings! Towering tree within the ear!
Everywhere stillness, yet in this abeyance:
seeds of change and new beginnings near.



Orpheus Roman mosaic

The Sonnets to Orpheus
Rainer Maria Rilke 1875-1926

But you, divine one singing on the brink of destruction while legions of forsaken maenads tore at your flesh; you vanquished their shrieks with harmony, oh bright one, while from utter devastation rebounded your song afresh.

And though you fade from earthly sight, declare to the silent earth: I flow.

To the rushing water say: I am.





John William Waterhouse (1849–1917)

"Nymphs Finding the Head of Orpheus" 1900

Riverine Mythology of the Americas Pablo Neruda 1904-1973

Entrance of the Rivers/ The Rivers Emerge

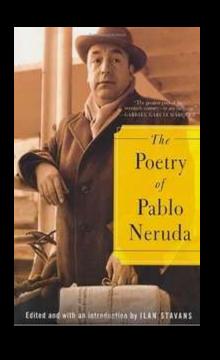
Los ríos acuden

Beloved of the rivers, beset
By azure water and transparent drops,
Like a tree of veins your spectre
Of dark goddess biting apples:
And then awakening naked
To be tattoed by the rivers,
And in the wet heights your head
Filled the world with new dew.

Amada de los ríos, combatida por agua azul y gotas transparentes, como un árbol de venas es tu espectro de diosa oscura que muerde manzanas: al despertar desnuda entonces, eras tatuada por los ríos, y en la altura mojada tu cabeza llenaba el mundo con nuevos rocíos.

Water rose to your waist,
You are made of wellsprings
And lakes shone on your forehead.
From your sources of density you drew
Water like vital tears
And hauled the riverbeds to the sand
Across the planetary night,
Crossing rough, dilated stone,
Breaking down on the way
All the salt of geology,
Cutting through forests of compact walls
Dislodging the muscles of quartz.

Te trepidaba el agua en la cintura. Eras de manantiales construida y te brillaban lagos en la frente. De tu espesura madre recogías el agua como lágrimas vitales, y arrastrabas los cauces a la arena a través de la noche planetaria, cruzando ásperas piedras dilatadas, rompiendo en el camino toda la sal de la geología, cortando bosques de compactos muros, apartando los músculos del cuarzo.



From *Canto General*, his epic reinterpretation of the history of the Americas. The poem comes at the beginning of the book, part of Neruda's pre-Colombian Genesis tale, where all is pure and man himself is the earth. Following his mythological vision of the creation of North and South America, this poem tells how the rivers emerged onto the surface of the earth, how intrinsically they and the land are bound together.

Riverine Metaphor

Emily Dickinson 1830–86

Have you got a brook in your little heart, Where bashful flowers blow, And blushing birds go down to drink, And shadows tremble so?

And nobody knows, so still it flows, That any brook is there; And yet your little draught of life Is daily drunken there.

Then look out for the little brook in March, When the rivers overflow, And the snows come hurrying from the hills, And the bridges often go.

And later, in August it may be, When the meadows parching lie, Beware, lest this little brook of life Some burning noon go dry!



My river runs to thee: Blue sea, wilt welcome me?

My river waits reply.
Oh sea, look graciously!

I'll fetch thee brooks From spotted nooks,—

Say, sea, Take me!

Sylvia Plath 1932-1963

Crossing the River

Black lake, black boat, two black, cut-paper people. Where do the black trees go that drink here? Their shadows must cover Canada.

A little light is filtering from the water flowers. Their leaves do not wish us to hurry: They are round and flat and full of dark advice.

Cold worlds shake from the oar.
The spirit of blackness is in us, it is in the fishes.
A snag is lifting a valedictory, pale hand;

Stars open among the lilies. Are you not blinded by such expressionless sirens? This is the silence of astounded souls.



Crossing Brooklyn Ferry

I too many and many a time cross'd the river of old,

Watched the Twelfth-month sea-gulls, saw them high in the air floating with motionless wings, oscillating their bodies,

Saw how the glistening yellow lit up parts of their bodies and left the rest in strong shadow,

Saw the slow-wheeling circles and the gradual edging toward the south,

Saw the reflection of the summer sky in the water,

Had my eyes dazzled by the shimmering track of beams,

Look'd at the fine centrifugal spokes of light round the shape of my head in the sunlit water,

Look'd on the haze on the hills southward and south-westward,

Look'd on the vapor as it flew in fleeces tinged with violet,

Look'd toward the lower bay to notice the vessels arriving,

Saw their approach, saw aboard those that were near me,

Saw the white sails of schooners and sloops, saw the ships at anchor,

Flow on, river! flow with the flood-tide, and ebb with the ebb-tide!

Frolic on, crested and scallop-edg'd waves! Gorgeous clouds of the sun-set!

drench with your splendor me, or the men and women generations after me;

Cross from shore to shore, countless crowds of passengers!

Stand up, tall masts of Mannahatta!—stand up, beautiful hills of Brooklyn!

Throb, baffled and curious brain! throw out questions and answers!

Suspend here and everywhere, eternal float of solution!



Walt Whitman 1819-1892



Langston Hughes 1902-1967

The Negro Speaks of Rivers

I've known rivers:

I've known rivers ancient as the world and older than
The flow of human blood in human veins.

My soul has grown deep like the rivers.

I bathed in the Euphrates when dawns were young.
I built my hut near the Congo and it lulled me to sleep.
I looked upon the Nile and raised the pyramids above it.
I heard the singing of the Mississippi when Abe Lincoln

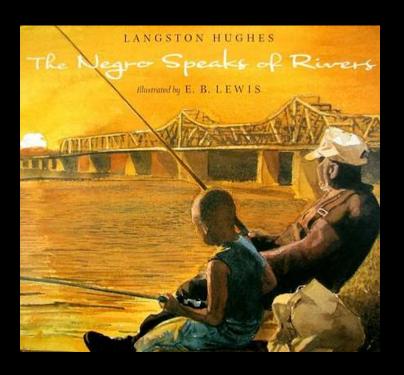
Went down to New Orleans, and I've see its Muddy bosom turn all golden in the sunset.

I've known rivers:

Ancient, dusky rivers.

My soul has grown deep like the rivers.





"The Negro Speaks of Rivers" was composed in 1920 on the train to Mexico when Hughes was still in his teens (eighteen to be exact), and published a year later in *Crisis*.

Robert Frost 1874-1963

West Running Brook

'Fred, where is north?'

'North? North is there, my love. The brook runs west.'

'West-running Brook then call it.'
(West-Running Brook men call it to this day.)

'What does it think it's doing running west
When all the other country brooks flow east
To reach the ocean? It must be the brook
Can trust itself to go by contraries
The way I can with you -- and you with me -Because we're -- we're -- I don't know what we are.
What are we?'



'Young or new?'

'We must be something.

We've said we two. Let's change that to we three.

As you and I are married to each other,

We'll both be married to the brook. We'll build

Our bridge across it, and the bridge shall be

Our arm thrown over it asleep beside it.

Look, look, it's waving to us with a wave

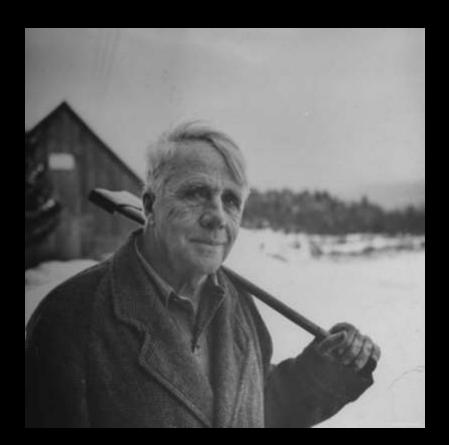
To let us know it hears me.'

'Why, my dear,
That wave's been standing off this jut of shore --'
(The black stream, catching a sunken rock,
Flung backward on itself in one white wave,
And the white water rode the black forever,
Not gaining but not losing, like a bird
White feathers from the struggle of whose breast
Flecked the dark stream and flecked the darker pool
Below the point, and were at last driven wrinkled
In a white scarf against the far shore alders.)

'That wave's been standing off this jut of shore Ever since rivers, I was going to say,' Were made in heaven. It wasn't waved to us.'

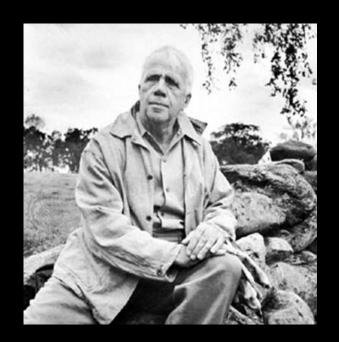
'It wasn't, yet it was. If not to you It was to me -- in an annunciation.'

'Oh, if you take it off to lady-land,
As't were the country of the Amazons
We men must see you to the confines of
And leave you there, ourselves forbid to enter,It is your brook! I have no more to say.'



'Yes, you have, too. Go on. You thought of something.'

'Speaking of contraries, see how the brook In that white wave runs counter to itself. It is from that in water we were from Long, long before we were from any creature. Here we, in our impatience of the steps, Get back to the beginning of beginnings, The stream of everything that runs away. Some say existence like a Pirouot And Pirouette, forever in one place, Stands still and dances, but it runs away, It seriously, sadly, runs away To fill the abyss' void with emptiness. It flows beside us in this water brook, But it flows over us. It flows between us To separate us for a panic moment. It flows between us, over us, and with us. And it is time, strength, tone, light, life and love-And even substance lapsing unsubstantial; The universal cataract of death That spends to nothingness -- and unresisted, Save by some strange resistance in itself, Not just a swerving, but a throwing back, As if regret were in it and were sacred.



It has this throwing backward on itself
So that the fall of most of it is always
Raising a little, sending up a little.
Our life runs down in sending up the clock.
The brook runs down in sending up our life.
The sun runs down in sending up the brook.
And there is something sending up the sun.
It is this backward motion toward the source,
Against the stream, that most we see ourselves in,
The tribute of the current to the source.
It is from this in nature we are from.
It is most us.'

'To-day will be the day....You said so.'

'No, to-day will be the day You said the brook was called West-running Brook.'

'To-day will be the day of what we both said.'





W. S. Merwin b. 1927

Another River

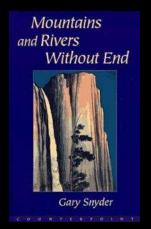
The friends have gone home far up the valley of that river into whose estuary the man from England sailed in his own age in time to catch sight of the late forests furring in black the remotest edges of the majestic water always it appeared to me that he arrived just as an evening was beginning and toward the end of summer when the converging surface lay as a single vast mirror gazing upward into the pearl light that was already stained with the first saffron of sunset on which the high wavering trails of migrant birds flowed southward as though there were no end to them the wind had dropped and the tide and the current for a moment seemed to hang still in balance and the creaking and knocking of wood stopped all at once and the known voices died away and the smells and rocking and starvation of the voyage had become a sleep behind them as they lay becalmed on the reflection of their Half Moon while the sky blazed and then the tide lifted them up the dark passage they had no name for





Endless Streams and Mountains

Clearing the mind and sliding in
to that created space,
a web of waters steaming over rocks,
air misty but not raining,
seeing this land from a boat on a lake
or a broad slow river,
coasting by.





Gary Snyder b. 1930





Raven's Beak River at the End

To the boulders on the gravel in the flowers At the end of the glacier two ravens

Sitting on a boulder carried by the glacier Left on the gravel resting in the flowers At the end of the ice age show me the way

To a place to sit in a hollow on a boulder Looking east, looking south ear in the river

Running just behind me nose in the grasses Vetch roots scooped out

by the bears in the gravels Looking up the ice slopes

ice plains, rock-fall Brush-line, dirt-sweeps

on the ancient river

Blue queen floating in

ice lake, ice throne, end of a glacier

Looking north up the dancing river

Where it turns into a glacier under stairsteps of ice falls





Green streaks of alder climb the mountain knuckles Interlaced with snowfields foamy water falling Salmon weaving river bear flower blue sky singer As the raven leaves her boulder flying over flowers Raven-sitting high spot eyes on the snowpeaks, Nose of morning raindrops in the sunshine Skin of sunlight

skin of chilly gravel

Mind of sifting

mind of running rivers,

flowers in the gravels,

At the end of the ice age we are the bears, we are the ravens, We are the salmon in the gravel At the end of an ice age Growing on the gravels at the end of a glacier Flying off alone flying off alone flying off alone

Off alone

Mind in the mountains, mind of running water



Jim Harrison b. 1937

Songs of Unreason

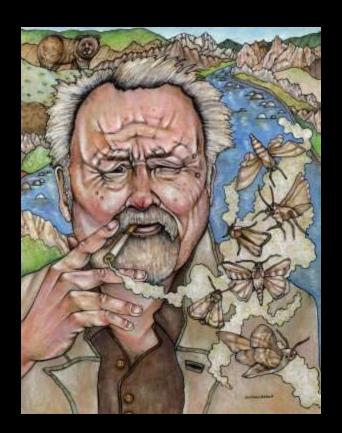
Azure. All told a year of water. Some places with no bottom. I had hoped to understand it but it wasn't possible. Fish.

Out of almost nothing, for practical purposes nothing, then back as ancient children to the great nothing again, the song of man and water moving to the ocean.

— From "River V"

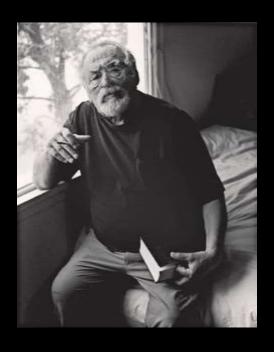
You have to hold your old heart lightly as the female river holds the clouds and trees, its fish and the moon, so lightly but firmly enough so that nothing gets away.

– From "River III"



Of course time is running out. It always Has been a creek heading east, the freight Of water with its surprising heaviness Following the slant of the land, its destiny. What is lovelier than a creek or riverine thicket? Say it is an unknown benefactor who gave us Birds and Mozart, the mystery of trees and water And all living things borrowing time. Would I still love the creek if I lasted forever?

- From "Debtors"

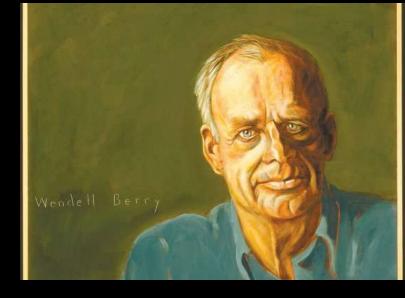


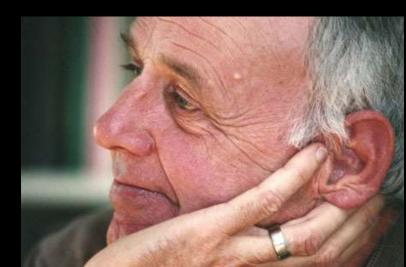
Jim Harrison

Wendell Berry b. 1934

The Peace Of Wild Things

When despair grows in me and I wake in the middle of the night at the least sound in fear of what my life and my children's lives may be, I go and lie down where the wood drake rests in his beauty on the water, and the great heron feeds. I come into the peace of wild things who do not tax their lives with forethought of grief. I come into the presence of still water. And I feel above me the day-blind stars waiting for their light. For a time I rest in the grace of the world, and am free.





Mary Oliver b. 1935

At the River Clarion

1.

I don't know who God is exactly.

But I'll tell you this.

I was sitting in the river named Clarion, on a water splashed stone and all afternoon I listened to the voices of the river talking.

Whenever the water struck a stone it had something to say, and the water itself, and even the mosses trailing under the water.

And slowly, very slowly, it became clear to me what they were saying. Said the river I am part of holiness.

And I too, said the stone. And I too, whispered the moss beneath the water.

I'd been to the river before, a few times.

Don't blame the river that nothing happened quickly.

You don't hear such voices in an hour or a day.

You don't hear them at all if selfhood has stuffed your ears.

And it's difficult to hear anything anyway, through all the traffic, the ambition.





If God exists he isn't just butter and good luck.

He's also the tick that killed my wonderful dog Luke.

Said the river: imagine everything you can imagine, then keep on going.

Imagine how the lily (who may also be a part of God) would sing to you if it could sing,

if you would pause to hear it.

And how are you so certain anyway that it doesn't sing?

If God exists he isn't just churches and mathematics.

He's the forest, He's the desert.

He's the ice caps, that are dying.

He's the ghetto and the Museum of Fine Arts.

He's van Gogh and Allen Ginsberg and Robert Motherwell.

He's the many desperate hands, cleaning and preparing their weapons.

He's every one of us, potentially.

The leaf of grass, the genius, the politician, the poet.

And if this is true, isn't it something very important?

Yes, it could be that I am a tiny piece of God, and each of you too, or at least of his intention and his hope.

Which is a delight beyond measure.

I don't know how you get to suspect such an idea.

I only know that the river kept singing.

It wasn't a persuasion, it was all the river's own constant joy

which was better by far than a lecture, which was comfortable, exciting, unforgettable.



3.

Of course for each of us, there is the daily life. Let us live it, gesture by gesture. When we cut the ripe melon, should we not give it thanks? And should we not thank the knife also? We do not live in a simple world.

4

There was someone I loved who grew old and ill One by one I watched the fires go out.
There was nothing I could do

except to remember that we receive then we give back.

5.

My dog Luke lies in a grave in the forest, she is given back. But the river Clarion still flows from wherever it comes from to where it has been told to go. I pray for the desperate earth. I pray for the desperate world.

I do the little each person can do, it isn't much.

Sometimes the river murmurs, sometimes it raves.



6.

Along its shores were, may I say, very intense cardinal flowers.

And trees, and birds that have wings to uphold them, for heaven's sakes—the lucky ones: they have such deep natures, they are so happily obedient.

While I sit here in a house filled with books, ideas, doubts, hesitations.

7.

And still, pressed deep into my mind, the river keeps coming, touching me, passing by on its long journey, its pale, infallible voice singing.



We need knowledge – public awareness – of the small cogs and wheels, but sometimes I think there is something we need even more. It is the thing that *Forest and Stream*, on its editorial masthead, once called 'a refined taste in natural objects.'

Have we made any headway in developing 'a refined taste in natural objects'?

- Aldo Leopold, "Round River"

