ROOTS OF THE PAST
NOURISH PRESENT RESEARCH

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This comic is based on the article, 'Early European observations of precipitation partitioning by vegetation: a synthesis and evaluation of 19th century findings' by Jan Friesen and John T. Van Stan II, published in Geosciences 9(10):423, https://doi.org/10.3390/geosciences9100423.
What will you do for your thesis research?

No idea! It seems like everything's been done already...

Well, maybe we should start with what catches our eye?

The canopy catches my eye. It's just so dense.

And complex!

I wonder how much sunlight it blocks.

Betch it blocks a lot of rain and snow.

WOAHH!

Look at the bark!

What kind of tree is this?
Rome, ~70 C.E.

What's this, Pliny?

Mmph! Where are we?

The shadow of walnut trees is poison to all plants within its compass.

Wha-- Pliny the Elder?

Sire, in the case of every variety of plant, the shade is found to act as a kind nurse or a harsh step-mother.

Oh, I heard about this in class! Walnut trees can add poisons to the passing rain, so that competing plants can't grow in the soils.

Yes, it's called allelopathy!

What secrets lie shrouded within your shade?

Pliny the Elder observed allelopathy?

Amazing!
Did we just go back to ancient Rome?

I think we did!

What else can plants do to the rain?

Pliny said the shade of plants hold many secrets.

Maybe we can find out more.

Do you see any more handprints?

Look...what's that up there?

Phew! We found another one.

What language is that? Arabic?

Let's see where we end up!
There are poisonous grasses, such that when the rains fall upon it, and run in torrents to the neighboring rivers...

...no one dares drink of the water during the time of their rising; and should anyone do so, he dies immediately.

...there are mines of gold on these mountains... and the plain below is used for agriculture.

Who thought that grasses could have such an effect on water quality?

Wait - there are many other factors influencing streamwater quality besides the vegetation.

It might not be the grasses entirely.

We know now that mining and agriculture can affect streamwater quality.

Right!
It's amazing how early all these processes were observed!

There are so many handprints. Come on!

Rainwater which falls on the shoot can drain down and nourish the bud.

Capt. George Glas

1764

Leonardo da Vinci

1478

Stephen Hales

1777

Cultured lands interrupt uniform forest so that in the end the forest distributes into scattered patches.
So, all these ecohydrological processes were observed centuries ago. But, when did people actually start measuring them?

Saxonian Academy for Foresters and Farmers, Tharandt, Germany, 1855

Sir, we need to quantify how much rain, snow and condensation...

Actually reaches soils.

I have an idea...
Krutzsch's idea was supported and spread throughout the German kingdoms.

Many other European countries became interested in this topic, as well!
Huh? Hundreds of liters?

The first measurements of stemflow blew the researcher’s mind!

They also found that to measure rain and snow patterns beneath trees...

...they needed many more gauges!

Wow, a lot of snow gets stuck in canopies!

Wollny even measured many of these processes in crops.

I wonder if they shared their findings.
Dr. Hoppe - it's almost time for the Forestry Councilor, Eduard Ney's talk! Let's go.

What correction factors do we use? Whether it is now exactly 51 or 59, I don't care. Today we do not really know whether it is 20 or 80%.

We still have not fully considered important factors, like species, age, climate, leaf budding and so on... these require wideranging and continuous observation, and can only be studied through international collaboration.
Wait - we're part of an international network.
LTS KEEP CLIMBING!

HORTON? I JUST READ THAT IN MY ECOHYDROLOGY COURSE!

GUESS WE KNOW WHERE IT GOES FROM HERE, THEN.

IT IS GETTING LATE. LET'S GO. WE CAN COME BACK.

NOBODY LOOKED AT... HMM...

I HAVE AN IDEA!
Where exactly does rainwater go beneath the canopy...

Let's see what our 'eyes in the sky' can tell me about...
Early European Observations of Precipitation Partitioning by Vegetation: A Synthesis and Evaluation of 19th Century Findings
by Jan Friesen and John T. Van Stan II

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