How to present language history?

Before SLIDE

The question of how to represent language history has been disputed for a long time in historical linguistics. The main debate was faught between those who defended a tree-like paradigm of language evolution, according to which languages evolve in processes involving split and independent modification. Among the earliest proponents of this view, or, as we could say, one of the earliest dendrophilists, was August Schleicher.

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In an early paper from 1853 he summarized his ideas about the descent of the Indo-European languages by emphasizing that their history can “be best illustrated with help of a branching tree”.

What is more interesting than the fact that Schleicher mentioned a tree in this context, is, however, how he visualized it in the same paper.

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As we can see here, the tree did not come any close to the beautiful diagrams we now see more and more often in the recent literature, but rather resembled a strong German oak. [Deutsche Eiche]

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Among the earliest dendrophobists, wo did not trust the idea of split and independent modification was Johannes Schmidt. The main reasons for Schmidt to mistrust the tree-model were based on contradicting data. Reviewing hte patterns of reflexes of common Indo-European roots in different Indo-European languages, he came to the conclusion that no true tree could be drawn out of the data. He thus concluded that

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“No matter how we look at it, as we stick to the assumption that today's languages originated from their common proto-language via multiple furcation, we will never be able to explain all facts in a scientifically adequate way.”

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Instead, Schmidt proposed to

“replace [the tree] by the image of a wave that spreads out from the center in concentric circles be coming weaker and weaker the far ther they get away from the center.”

Although many scholars liked this idea, it was never able to completely replace the family tree model. One of the major reasons was that nobody actually knew how to visualize Schmidt's famous “wave theory”. This can be illustrated by having a look at different visualization attempts which were made after Schmidt's proposal.

Among these, we find

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Things that resemble pie charts, but which apparently are also intended to have a geographic dimension, as in this exmample from Antoine Meillet.

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We find isogloss maps, which are still incredibly difficult to draw automatically, as in this example by Bloomfield from 1933.

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We find early networks, as in this example from Bonfante, which is also geographically oriented.

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And we also find what resembles a Venn diagram, as in this example from Hirt 1905.

What is striking in all these visualization attempts, and also in the treatment of waves by Schmidt is the fact that they do not really improve on the trees.The wave-theory in this notion does merely replace the temporal with a more or less areal dimension. As a result, all these visualizations remain static. They don't show real language history.

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A more realistic alternative for the visulization of language history was proposed in an early talk by Hugo Schuchardt, presented in 1870, but published only 30 years later. In this talk, Schuchardt proposed

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to replace the image of a family tree [...] with another one. Take the whole complex of Romance tongues and color it all in one and the same white color, representing the formerly common idiom.

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This white will then become darker, taking different tones of color which slowly sharpen their contrasts until finally the colors of the rainbow appear in front of our eyes.

It is, of course, clear, that such a realistic scenario, which is like a video demonstration, can only be drawn if the full history of languages is known. Since this is not the case, even for the Romance languages, we are afraid that Hugo Schuchardt's initial idea will still have to wait for its implementation.

However, providing a way to combine the geographic and the temporal dimension with help of interactive visualization techniques is possible now. In the following, we will present how this can be done with help of recent visualization libraries for JavaScript.