

Feelings and Facts in Fly Casting

When I first stated about one decade ago, that according to my feeling the 'load', deflection respectively of the fly rod could provide a significant advantage in term of minimizing the casters effort, I earned a lot of objections. A lot of people replied that the meaning of the 'load' is absolutely overrated. In their opinion the 'load' provides basically geometrical advantages – especially to carry the tip of a fly rod on a straight path. They base their opinion basically on results of the following physical investigations:

1. "The Rod & The Cast" by Lövoll / Borger from 2007. This great investigation pointed e.g. out, that the stored energy of the fly rod contributes about 20% to the final tip speed, what is rather less.
2. Outcome of modelling the fly cast with a simple harmonic oscillator. This 1D model pointed out, that the deflection indeed provides an advantage in terms of efficiency (ratio of the output / input energy), but this advantage will be more or less completely eaten up by the energy loss caused by both the counterflex and the energy conversion from the stored back into the kinetic, which waste energy.

Today more recent insights are showing that the deflection (and the 'load' as a part of it) is the requirement for a significant better energy transfer along the fly rod shaft, which rises the efficiency. After I've occupied myself with the aforementioned investigations I came to the following valuation:

To 1. = The energy transfer was not in the focus of the investigations by Lövoll / Borger. To claim the 'load' - the more as it occurs together with the deflection - can't play an important role since it contributes rather less to the final tip speed is risky.

To 2. = A simple 1D model is basically not able to face the redistribution of energy, angular momentum respectively taking place due to the deflection. On the other hand 2D models are showing, that aside the 'load' an energy redistribution, redistribution of angular momentum respectively takes place enabling a better energy transfer from the grip towards the tip of the fly rod (made possible by the modification of the moment of inertia in combination with the varying angular velocities of the mass elements of the fly rod - see following video <http://vimeo.com/226547073>). Further more the disadvantage of the counterflex must not be as big as assumed. I've read about an average counterflex by about 66% in comparison of the biggest previous deflection, but it is fair to say that an average reduction on below 20% is absolutely possible.

Physical facts are saying that the deflection provides a big potential regarding energy transfer and it is up to the caster to make the most of it. So in terms of minimizing the casters effort the meaning of the deflection is not at all overrated. To me it is good to know that my feeling I have over one decade matches physical relations. The physical background of 1. and 2. can't be approached for explaining the entire characteristics of the fly rod. Whatever 'feeling' is supposed to tell.

Of course in fly fishing there are several points which are important to catch the fish – but for the most common fishing situations the fly fisher can profit by hitting the target with less effort possible – and controlling the deflection is a very important key to it (see following video <http://vimeo.com/221011910>).

"The flexible elastic lever is a very smart mean to maximize energy in the line and minimize the one left in the rod." (Merlin from sexyloops.com, 05/2018)

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