

A MASTERS GUIDE TO BUILDING A BAMBOO FLY ROD

by Everett Garrison and Hoagy B. Carmichael

This book, recently presented to the Club by Hoagy Carmichael, is a remarkable treatise. In it is contained, nay enshrined, the sum and substance of the art and craft of hand building a cane rod, in a highly individual manner as seen by a skilled craftsman (Garrison) and his author-acolyte. If anyone had the skill and knowledge (and, not to be omitted, the equipment) and then followed the instructional method carefully, using suitable material, he should

end up with a first class rod. There can be few of the little tricks of the skilled craftsman that are not explained and fully illustrated, in itself admirable on account of the frequent secrecy of craftsmen. Of course others may have, quite properly, other ways, but one would be hard put to fault the way in which the craft work is explained and presented.

On the technical side there are many interesting points, one of the main ones being the use of an adjustable-groove vee-block to form the cane tapers, in place of the more widely known equilateral triangle, with a corner removed in a taper, that is accepted practice in many places, and was certainly in commercial use until recently, and may well still be by some specialist craftsmen makers.

One can only admire the self-help and ingenuity applied to the making of all the apparatus and equipment that is used, for example in making a winding machine for use in the glueing operation, and also the varnish dip tanks up the staircase (or later through the bedroom floor!) in his house. For a total lifetime production of under 1,000 rods they must have represented a considerable investment of time and energy. Who but a fanatic would make an oven to help in making rods? Your reviewer was interested in the suggested use of a bakery oven, which was the system used until the late fifties by a then quite well known maker, who took his cane to the local baker for oven-curing after the bread was taken out. It apparently worked, and may still be in use in some places.

The theoretical side, however, causes some misgivings. A rigorous dynamic (and it is a dynamic, not static, problem) analysis of an object at once as simple, and as complex, as a fishing rod is exceedingly difficult, and it must be admitted that the development of rods, over the years, has largely been on an empirical basis with a great deal of cut and try, and a considerable input of personal opinion by experts of varying expertise. The major shortcoming, in the book under review, in the analysis of the forces acting on the rod and line system, is that it has been treated (apart from the use of a variable "impact factor", 2.5 or 4 at different times) as an exercise in structural analysis, with the usual civil engineering constraints and the assumption of minimal structural deformation. This obviously does not apply to a highly flexible structure, with large deformations and deflections. For example it is all very well saying what the maximum tip loading, using the impact factor of say 2.5, may be, but of course by the time the tip load has built up to this, over a fraction of a second, the rod has deflected by an amount of perhaps a third of its length, with very great changes in the bending

moments arising along its length. The vertical loads will also vary with the rate at which the casting impetus is applied.

When considering the external forces on the rod it is correct to include the tension of the line at the rod tip, acting approximately at right angles to the handle at the instant of maximum deflection, and opposing the turning moment applied by the hand. However, the actual bending forces on the rod are differently derived, and it is an erroneous simplification to use this as the basis for determining the bending moments for subsequent stress calculation. The forces applied to the rod, by the line, occur at each ring, and are, for the intermediate rings (to a first approximation) at right angles to the rod, while the force at the tip ring is at the bisector of the angle made by the line over the tip ring. (This assumes, for relative simplicity, that the line causes zero friction over the rings.) It follows that the bending moment at any point will be the sum of the moments caused by the forces acting at the rings beyond that point. These forces at the rings do, however, equate to the external forces, but they can alter the stresses along the rod, particularly under high deflections. It could probably be demonstrated quite easily experimentally (with a very simple type of radius gauge) that the point of maximum stress moves along the rod as load increases, and the load is progressively transferred from the tip down the rod as a consequence of the increasing deflection with load. It will also vary with the angle at which the line leaves the rod tip. After all the middles and butts of rods often break as well as tips, apart from the effects of car doors.

It is interesting also to note that the correct deductions have been made for the benefits of the hexagonal section, and the demerits of pentagonal construction, and also to point out that homogeneous equilateral polygons of similar cross sectional are equally resistant to bending across any given plane.

One further main omission in the stress calculation and analysis is the effect of air resistance, which is not unimportant with tip velocities of around 80-100 feet per second. These high velocities, sometimes compounded by casting in a high wind of perhaps 30-40 feet per second, are quite important. Again they could be studied experimentally, using relatively simple apparatus to give controllable and uniform velocities at which deflection could be observed. All this is a splendid subject for further debate and discussion, but that would take a whole copy of the Journal, or more, so we will have to wait for another occasion.

There are a few minor textual errors, inevitable one supposes if a highly technical book, which this is, has to be completed and concluded after the death of the principal subject and author, and a few "americanisms" occur which take a little getting used to, such as "micing" the size of something, which in this country would be spelt "miking".

All in all, then, a substantial and detailed, and highly personal treatise on a subject obviously very interesting to dedicated fly fishermen, and it must be about the only book as detailed on the subject that is available at the present time. It thus must be regarded as a considerable testimonial to both the authors, and in the nature of a splendid testament to the highly dedicated craftsman who was Everett Garrison.

G.C.A.