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- △ maximum amplitude during the whole period considered (23.5 s)
- □ maximum amplitude during the last 3 1/2 wave periods (3.3 s)
- o Average amplitude and number of considered oscillations during the last 3.3 s.
- ∞ Instability of the algorithm (this signifies that the drift-wood is thrown over the stems).

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Z_x, Z_z driving force
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The graph remains qualitatively unchanged if the bending moment M or the (maximum) stress σ of a cross section is plotted on the vertical axis instead of the force F, also, if the deflection δ on the horizontal axis is replaced by the strain ε.
Between point 0 and 1 load and deformation are directly proportional to each other; loading and unloading follow the same line (elastic region, no remaining deformation). If the load exceeds point 1 (e.g. at point 2), unloading follows the dashed line, i.e. a certain deformation remains, even if the load is zero (plastic deformation). If the force exceeds the breaking strength (point 3), the further part of the curve depends on the experimental layout: the dash-point line represents the case of a stem loaded by a given increasing deformation, the unbroken line holds if the load is interconnected with displacements (e.g. load by a spring balance).

1.7. Three possible experimental layouts for testing reed stems, with corresponding support forces, distribution of bending moment and deflections. *p. 346.*
1. stem fixed at one end, forced at the other
2. stem supported on both ends, forced between the supports (e.g. in the middle)
3. stem supported on both ends, forced at two symetrically located points

1.8. Example of a bending experiment, the load being increased by steps. *p. 348..*
The relation load increment to deflection increment ($dF/d\delta$), needed for computing the bending stiffness, is obtained as the inclination of the regression line through points 2 to 6. Because of the backlash at the beginning of the experiment (points 1 and 2), point 1 must not be used for the regression as well as the points beyond the linear-elastic region.

1.9. Example of a bending experiment with continually increasing load and automatic plotting of force and deflection. *p. 348.*
The straight line representing the force-deflection function within the linear-elastic region and the point of critical force F_{Gr} are obtained graphically.

1.10. Breaking does not necessarily and always happen at the point with maximal bending moment (at the stress point), for the breaking strength varies considerably along the stem axis. Under increasing load, breaking occurs at the point, where the local bending moment first reaches the local breaking strength. *p. 350.*

3.1. Schematic diagram of the experimental layout for labarotory experiments at EMPA. The situation is turned upside down compared with fig. 1.7., the testing machine pulling upwards when loading. *p. 355.*
F = force
D = diameter defined as representative for the tested piece

3.2. Schematic view of the experimental facilities for labarotory experiments at EMPA (cf. fig. 3.3.). *p.357.*

3.3. Photo of the facilities schematically shown in fig. 3.2. *p.358.*
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3.4. Influence of the date of testing on the characteristics of strength, viz. ideal breaking stress (left hand line at every date), ideal critical stress ("yield stress"; middle line) and ideal Young's modulus (right hand line). The specimens were gathered on 13. 7. 77 from "Großes Loch" (cf. fig. 3.6.), tests were carried out on 13. 7., 19. 7. and 28. 7. respectively. *p.361.*

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3.6. Plan of the reed stand at Altenrhein SG on Bodensee-Obersee, with sample sites (scale about 1 : 3350). *p.365.*
- "Großes Loch Nord": preliminary experiments for measuring solidity and stiffness and the influence of testing date.
- plots 1.2, 4.1, 4.3, 5.1, Z and G: bending experiments for measuring solidity and stiffness
- C_1, C_2: measuring the degree of fixation in the ground (cf. chap. 5.)

The denomination of sector D* originates from earlier investigations (KLÖTZLI and ZÜST 1973 a,b)

3.7. Ideal Young´s modulus of the stems from Altenrhein on 13. 6. 79. *p.374.*
The lines belonging to every plot correspond, from left to right, to the first, second and third cut above ground respectively (this remark is also valid for fig. 3.8.-3.10.).

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$M_E = h_F \cdot F$ = fixed end moment due to the force F
α_E = inclination of the stem foot
δ_F = displacement due to the force F
δ_α = displacement due to the inclination of the stem foot

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P_i: force exerted on the stem
R_i: friction
α_i: inclination of the stem foot

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·-·-· stems from within the stand (no. 1÷16)
----- stems from the front side of the stand (no. 51÷62)

Section IV

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