Stringdiametre and elongation coefficient

Remy Gug shows in his analysis to the Nuremberg wire numbering that the wire diametres were defined through weight and length in former times as people hadn't had the micrometer as we.

People knew the *"Drahtklinke"* which was for testing but not a measuring instrument. On the other one shouldn't forget the weight and length units at that times haven't been standarised.

Gug described this procedure how the wire drawer had to reach a certain given wire length per weight unit. If a wire will be reduced halven in the diametre it will become four times longer. Of course the wire length is easier to mesure than the diametre of the wire. The wire swifts with defined extent were well known. The wire which should be measured was drawn over it. Also "Zängelmaße" are described. This is a piece of sheet metal which was cutted slanting at the upper border and which had four marks. If the wire lengthend from the first to the fourth mark one diameter reduction step was reached, for example: if a wire drawer would draw a certain weight unit to eg. 100m length and he missed it by 2.5%, that means 102.5m instead of 100m, this corresponds to a diametre flaw of 0,005 mm at the diametre 0,2 mm. The elongation could be defined in advance with only a small sample with the "Zängelmaß". The "Zängelmaß" had 48,8 mm (2 inch). If the wire drawer made the described flaw of 2,5% the length was 1,22 mm. This is a flawsize which could be seen with the "Zängelmaß" without any problem.

In former times it was quite possible to reach exact diameter steps. Through the procedure with the *"Zängelmaß"* there are also constant diametre reductions with constant reduction coefficients.

In our time the question is if the wire diametres should be produced in a metric system eg. 0,20 mm, 0,225 mm, etc. or if it is more important to have a regular diametre reduction for the instrument building or the scaling interpretation.

We have decided for the Nuremberg system how it was demanded from Remy Gug. It is not decisive if the numbering made of him is historical correct, but that the diametre reduction runs over the whole range in 5,313 % steps. With this a fine and regular diametre transition is possible, what would not be able with a metric gradiation.

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