

## Coleoptera Measurement Units



# How long is the Line?

I just happen to have Stearn's "Botanical Latin" on my lap - line[unspecified], 1/12"; English line, 2.1 mm; French line, 2.3 mm. Nothing about Chile. P. Stevens

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In the early literature, at least for insects (Entomology), many European authors gave measurements in LINES (lignes in French), but there seems to be confusion about whether this was a uniform standard across European countries and what a line is equal to. Some earlier workers, Scopoli (1763, *Entomologia Carniolica*) printed a scale in the front of his work. His line was equal to 2.14 mm. Fairchild (1967, *Pacific Insects* 9: 75) wrote that the line of Wiedemann (another earlier worker from 1810-30) used a line equal to 2.18. Once I copied information from an "Webster's Unabridged Dictionary" which had a table indicating that a line from France was equal to 2.256 mm, 2.12 for England, 1.9 mm for Chile. Unfortunately I copied that information when I was a graduate student back in the mid 1960's and didn't note the edition of the Webster's. If any one have better information or citations on lines as a unit of measurement in taxonomy, I would appreciate them. F. Christian Thompson

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Christine von Hayek at the then-British Museum (Natural History) had a fantastic little scale with English, French and German lines on it. They were all different. She included the various sizes of each in her 1973 paper "Reclassification of the subfamily Agrypninae (Coleoptera: Elateridae)" published in *Bulletin of the British Museum (Natural History) Entomology Supplement* 20: 1-309. Unfortunately, my copy walked several years ago, and I have not been able to replace it, but it had all kinds of wonderful information. If I remember correctly, it was in the back in an appendix. It could also have been in the 1979 *Additions and Corrections*, published in the *Bulletin of the British Museum (Natural History) Entomology* 38: 183-261, as my copy had them bound together. Mike A. Ivie

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Les mesures de longueur et de poids variaient légèrement non seulement d'un pays à l'autre, mais d'une ville à l'autre et, qui plus est, d'une époque à l'autre ! En France, la Révolution fut l'occasion de commencer la normalisation des unités de mesure. La recherche peut se faire dans des encyclopédies et doit porter sur « pied » (et ses traductions dans différentes langues, foot, Fuß, etc.). Par exemple, dans le Larousse du XXe siècle (vers 1935) on trouve à « mesure », les unités actuelles pour la France, les colonies françaises, l'Angleterre, les États-Unis d'Amérique, l'Éthiopie, la Chine, le Japon, la Perse, etc., et les

unités anciennes pour l'Égypte, la Chaldée et l'Assyrie, les Perses, les Juifs, les Grecs (système attique), etc. Voir aussi, en particulier avec espoir de trouver les unités de mesure pour le Chili, l'Enciclopedia universal ilustrada europeo-americana (plus de 140 000 pages formant 70 volumes de 1600 pages chacun, plus 19 volumes de suppléments, édité à Barcelone en 1909). Il faut se rappeler que 1 pied = 12 pouces, 1 pouce = 12 lignes, 1 ligne = 12 cheveux. Voir aussi W. T. Stearn, *Botanical Latin*, 4e éd., p. 111-112, Measurements, qui reproduit des données trouvées dans Linné (*Philosophia botanica*, 1751). En Allemagne on utilisait le Fuß décimal (10 Zoll) ou duodécimal (12 Zoll), mais aussi le Werk- ou Baufuß de 11 Zoll, et le Feldfuß (ou Landschuh) de 10 Zoll (Fuß décimal). Pour éviter les variations locales, on avait une notion de pied, de pouce, etc., impérial. On peut supposer que c'est souvent la notion implicite utilisée dans les ouvrages d'histoire naturelle. En pratique, les variations dans la définition de ces unités de longueur (de l'ordre de quelques pour cent) n'ont pas vraiment d'influence sur les dimensions données par les auteurs, du moins en ce qui concerne la mycologie. Jacques Melot P.-S. Puisque vous êtes entomologiste, vous n'avez peut-être pas le livre de Stearn sous la main. Voici donc ce qu'écrit cet auteur : Before the adoption of the metric system, devised in France at the end of the eighteenth century, authors used the traditional units based on the human body such as the foot (pes), the span (spithama), etc. Linnaeus's *Philosophia botanica*, 262, no. 331 (1751) provides a convenient summary : CAPILLUS (i.e. a hair's width) = Lineae pars duodecima = 1/12 Paris line = 0.18 mm. LINEA = Linea una Mensurae parisinae = 2.25 mm. UNGUIS (i.e. the length of a fingernail) = Lineae sex sive unci dimidia = 6 lines = 1.35 cm = 1/2 inch (approx.) POLLEX (i.e. the length of the terminal joint of the thumb) = Uncia una parisina = 1 Paris inch = 12 lines = 2.7 cm = 1 1/12 inch (approx.) DIGITUS (i.e. the length of the index finger) = Unciae duae = 3.4 cm = 2 1/6 inches (approx.) PALMUS (i.e. the width of the four fingers together) = Unciae tres parisienses = 3 Paris inches = 8 cm = 3 1/4 inches (approx.) DODRANS (i.e. the distance between the tips of the thumb and the little finger when extended) = Unciae novem = 9 Paris inches = 9 Paris inches = 24.3 cm = 9 1/2 inches (approx.) SPITHAMA (i.e. the distance between the tips of the thumb and the index finger when extended) = Unciae septem = 7 Paris inches = 19 cm = 13 inches (approx.) PES (i.e. foot) = Unciae duodecim = 12 Paris inches = 32.5 cm = 13 inches (approx.) CUBITUS (i.e. the distance from the elbow to the tip of the middle finger) = Unciae septendecim = 17 Paris inches = 46 cm = 1 1/2 feet (approx.) BRACHIUM (i.e. the distance from the arm-pit to the pit of the middle finger when extended) or ULNA = Unciae viginti quatuor = 24 Paris inches = 65 cm = 2 feet 1 inch. ORGYA (i.e. the distance between the tips of the middle fingers when the arms are extended) = 6 Paris feet = 1.95 m = 6 1/2 feet (approx.). J. M.

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In the original Latin, Linnaeus also defines a line as the length of a lunule (the white part at the base of a fingernail) extended from the root of the fingernail towards the [tip of the] nail (but not on a thumb). See . I don't seem to have any lunules, so for me 1 line = 0 mm. In the same work, Linnaeus has a drawing of three Parisian inches, three English inches, and three Swedish inches(). In my copy, his 3 Parisian inches as printed are 81 mm long. So 1 Parisian inch = 27 mm and 1 line (1/12 inch) = 2.25 mm, as Stearn says. His 3 English inches = 75 mm, so 1 English inch = 25 mm and 1 (English?) line = 2.083 mm. His 3 Swedish

inches = 73 mm, so 1 Swedish inch = 24.333 mm and 1 (Swedish?) line = 2.028 mm. Those are measurements straight from a 1770 edition of the *Philosophia Botanica*. You should allow for errors in printing, I suppose. But it seems you can't go wrong with Linnaeus if you say a line is about 2mm. Mark A. Garland

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In a German "Lexikon der Mass- und Waehrungseinheiten" (Encyclopedia of measurement and currency units. By Lutz Adron, Praesentverlag Heinz Peter, Guetersloh 1987) I found on p. 123: Paris 2.2558 mm, Rhineland (Germany) 2.179 mm, Vienna (Austria) 2.195 mm, England and Russia 2.116 mm. In addition, I found in Wolfgang Trapp "Kleines Handbuch der Masse, Zahlen, Gewichte und der Zeitrechnung" (Small handbook of measurements, numbers, weights and calendars. Philip Reclam jun., Stuttgart 1992) on p. 229f. that one Parisian foot (Pied de Roi) was 32.47325 cm long in the 18th century, 32.48394 in the 19th, and that the latter was the "official" length (the 22nd part of a Perche Royale) and comprised 144 Lines, resulting in 2.255829 mm. These figures do certainly not clear the mess but rather proof it.

Here, on p. 11 is given: 1 English line = 2.117 mm, 1 German line = 2.191 mm, 1 French line = 2.250 mm. Dr. von Hayek refers to a "six inch ivory ruler by Janson of Russell Street, London" that "shows that the English, French and German lines differ in length".

Greetings

Michael Schmitt

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Burmeister's Manual of Entomology (translated by Shuckard, 1836, p.26) says "A universally known measure, - the Paris line, - the twelfth part of an inch, has been adopted as unit for the determination of the length of insects." One-twelfth of an English inch is 2.117 mm, but the Paris line was one-twelfth of a Paris inch (pouce) - i.e. 2.258 mm (all rounded up). Fortunately when the French aristocracy were "all rounded up", the metric system was introduced and we eventually adopted millimetres :-). Tony Irwin

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Through the courtesy of Max Barkley at the Natural History Museum, I have finally found the following data on the various "lines" used in early taxonomic literature. On Page 11 of C. M. F. von Hayek's 1973 "Reclassification of the subfamily Agrypninae (Coleoptera: Elateridae)" [published in Bulletin of the British Museum (Natural History) Entomology Supplement 20: 1-309] she states: "A six inch ivory ruler produced by Janson of Russell Street London, shows that the English, French and German lines differ in length." She then lists:

1 English line = 2.117 mm

1 German line = 2.191 mm

1 French line = 2.250 mm

Michael A. Ivie

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