Notes on European Data Set

The data contained in this Excel file were collected as part of a project funded primarily by the US National Science Foundation and carried out between 2007 and 2015. The primary researchers involved in the project were Christopher Ruff (Johns Hopkins University, Baltimore, cbruff@jhmi.edu), Brigitte Holt (University of Massachusetts, Amherst, holtmb@hotmail.com), Markku Niskanen (University of Oulu, Finland, markku.niskanen@oulu.fi), Vladimir Sládek (Charles University, Prague, sladekv@yahoo.fr), and Margit Berner (Natural History Museum, Vienna, margit.berner@NHM-WIEN.AC.AT). To facilitate communications regarding the data file, the primary investigator responsible for collection of data for each specimen is indicated in the file; please contact these individuals with questions on specific samples or specimens. C. Ruff may be contacted with general questions. For certain of the earlier specimens, some or all data were obtained from other sources, as noted in the file: 1) E. Trinkaus, S. Churchill, and/or T. Holliday, pers. comm.; 2) Matiega, 1934, 1938; 3) Cro-Magnon 4322: femoral length from Vallois and Billy (1965), vertebral measurements from Holliday (1995) (Cro-Magnon 3), and femoral head breadth estimated from the acetabular height of CM 4315 provided in Gambier et al. (2006) (see below for full references). B. Holt may be contacted with questions regarding these specimens.

The primary publication associated with this file is: Ruff, C. B. (ed.) (2018) *Skeletal variation and adaptation in Europeans: Upper Paleolithic to the Twentieth Century*. Hoboken: Wiley Blackwell. While a basic description of variables is given in the present document, please see this source (particularly chapters 1-5) for more detailed information. Any use of the data given in the file should be accompanied by citation of this book and the present website (http://www.hopkinsmedicine.org/fae/CBR.html). Other publications that have used major subsets of the present data set include Ruff et al., 2012, 2015, and Sladek et al., 2016.

Due to some minor changes in the date set subsequent to analyses carried out in Ruff (2018), the total sample size in the present data file (n = 2177) is slightly different than that reported previously (n = 2179), as is also the case for a few of the specific temporal/geographic subsamples (differences in sample sizes vary by no more than one individual in any of these). None of these changes had any noticeable effect on results.

Data are sorted by temporal periods, from most recent to oldest, and then by seven broad geographic regions. See any of the references in paragraph 2 above for more information on these divisions. Subregions are also given, and in some cases temporal periods are further subdivided. The Central European Opava-Pivovar sample, although dating from somewhat later in time, was grouped with Late Medieval period samples for analyses, as described in Chapter 11 of Ruff (2018). Date ranges for sites are shown as given in original reports and include years AD/BC, BP uncalibrated and BP calibrated, as indicated in the file. The Years BP variable converts all of these to a mean age in years BP; uncalibrated radiocarbon dates were converted using quickcal2007 ver.1.5 (www.calpal-online.de). For the Neolithic and earlier periods, where radiocarbon dates were available for some or most specimens, "present" was set at 1950 AD; for more recent periods, 2000 AD was used. In the Very recent (20th century) samples, Date range

and Years BP refer to the year of death. The Culture variable provides more information on archaeological associations, ethnicity, or other lifestyle attributes, as appropriate. Diacriticals were not used for Central European site names due to problems in correct translation across platforms.

Average and maximum slopes within a 10 km radius of each site were used to categorize local terrain, as described in Chapter 5 of Ruff et al. (2018), with Terrain codes of 1 ("flat"), 2 ("hilly"), or "3" ("mountainous"). In the Rural/Urban variable, 1 = rural and 2 = urban. For Sex, 1 = male and 2 = female. Specific ages are given for known-age Very recent or Early modern individuals, with ranges and means of ranges given for others. Individuals that could not be aged were given the mean age of the pooled sample (38 years). These ages were used in stature calculations derived from the anatomical method (Equation 1 in Raxter et al., 2006; also see Raxter et al., 2007).

All skeletal linear dimensions are in mm. Bi-iliac breadth (BILIAC) does not include any soft tissue correction. Although not reported in Ruff (2018), two M-L sacral breadths were taken on many specimens and are included here for future reference: ML1 is the M-L breadth described by Tague (1989), measured between the most anterior points of the auricular surfaces; ML2 is maximum M-L breadth of the entire sacrum. PRESACRAL HT. is the sum of vertebral body heights (maximum anterior to the pedicles) of L5 through C2. Missing vertebral heights or talar+calcaneal heights were estimated as described in Ruff et al. (2012). S1HT: anterior height of S1 sacral segment; BAS-BREG HT: basion-bregma height; TAL-CAL HT.: talar+calcaneal height. The sum of TAL-CAL HT., femoral and tibial bicondylar lengths (FBICLN, TFULLN), S1HT, PRESACRAL HT., and BAS-BREG HT. is skeletal height, in mm (SKELHT_MM). (See Raxter et al., 2006, for descriptions and illustrations of these measurements.) This was converted to cm and used to calculate anatomical (living) stature (ANATSTAT, in cm) using equation 1 in Raxter et al. (2006): Stature = 1.009 * skeletal height - (0.0426*age). As described in Niskanen and Ruff (2018), anatomical stature was also calculated for individuals with all dimensions except basion-bregma height, by calculating partial skeletal height, i.e., height without basion-bregma (PSKELHT_MM), and using this dimension, converted to cm, in the following equation: Stature = 1.045 * partial skeletal height + 19.11 (r = .996, SEE = 0.717 cm). Stature in this equation was anatomical stature calculated from full skeletal height, where available, in our sample (n = 537), and thus was already adjusted for age. Statures for individuals without an anatomical stature estimate were calculated from long bone lengths using formulae derived from this sample (Ruff et al., 2012). Body mass is in kg and calculated from stature and bi-iliac breadth (when both dimensions were available) or femoral head S-I breadth (Ruff et al., 2012; also see Niskanen and Ruff, 2018).

For long bone dimensions: F=femur, T = tibia, H = humerus, R = radius. FSIDE and TSIDE: 1 = right, 2 = left; sides for upper limb bones indicated with R and L in variable name. MAXLN: maximum length (including tibial spines); BICLN: bicondylar length; BIOLN: biomechanical length (or length'), used to locate cross sections; FULLN: length used in anatomical stature calculation; FHDSI: femoral head S-I breadth; FDML: femoral distal articular M-L breadth; TPLML: tibial plateau M-L breadth; HHDSI: humeral head S-I breadh; HDML: humerus distal articular M-L breadth; AP and ML: shaft breadths at the given locations (50% or 35% of biomechanical length from the distal endpoint of that length) (see Ruff, 2002 and Raxter et al.,

2006 for descriptions).

For greater convenience for use in formulae, abbreviated versions of many of these variable names were employed in Ruff et al., 2018 (see chapters 1 and 2). Equivalent names are as follows (Ruff et al. 2018 first): ML = MAXLN, BICL = BICLN, BIOL = BIOLN, TLCL = TFULLN, TCH = TAL-CAL. HT., CML = CLAV. MAXLN., FHSI = FHDSI, HHSI = HHDSI, VCH = PRESACRAL HT., BBH = BAS-BREG HT., BIB = BILIAC, SKH = SKELHT_MM, PSHT = PSKELHT_MM, ASTA = ANATSTAT, STA = STATURE.

Cross-sectional dimensions: IX and IY: second moments of area about the x and y axes (A-P and M-L bending rigidities, respectively); ZX and ZY: section moduli about the x and y axes (A-P and M-L bending strengths, respectively); TA and CA: total subperiosteal and cortical areas; IMAX and IMIN: maximum and minimum second moments of area (bending rigidities); J: polar second moment of area (torsional and (twice) average bending rigidity); ZP: polar section modulus (torsional and (twice) average bending strength). Areas are in mm^2, second moments of area in mm^4, and section moduli in mm^3.

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