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«Numerous and tall»: a revision of the Late Neolithic human remains found in a collective burial site at Sclaigneaux (Prov. Namur), Belgium

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Summary

The aim of this research was to study the human remains excavated in 1872 from a cave located in Sclaigneaux (Prov. Namur). The ^{14}C-dating of a human tibia gives 4155 ± 35 BP and makes the collective burial going back to the Late Neolithic period. The minimum number of individuals is 58 (45 adults and 13 children). Both the children and the adults were buried in the cave, whatever their gender and their age. Compared to other Neolithic samples from the Meuse Basin, Sclaigneaux individuals were amongst the tallest. They also displayed a good state of health.

Keywords: Neolithic, anthropology, collective grave in cave, Meuse basin, Belgium.

Résumé

Le but de cette recherche était l'étude des restes humains découverts en 1872 dans une grotte située à Sclaigneaux (Prov. Namur). Une datation au radiocarbone réalisée sur un tibia humain donne 4155 ± 35 BP et fait remonter la sépulture collective au Néolithique final. Le nombre minimum d'individus s'élève à 58 (45 adultes et 13 enfants). Enfants et adultes ont été enterrés dans la grotte quels que soient leur sexe et leur âge. Comparés à d'autres échantillons néolithiques du bassin mosan, les individus de Sclaigneaux étaient parmi les plus grands. Ils présentaient également un état de santé satisfaisant.

Mots-clés : Néolithique, anthropologie, tombe collective en grotte, bassin mosan, Belgique.

Samenvatting

Het doel van dit onderzoek was het bestuderen van de menselijke resten die in 1872 in een grot te Sclaigneaux (Prov. Namen) ontdekt zijn. 14C-datering van een menselijke tibia levert 4155 ± 35 BP op en brengt het collectief graf terug tot het Late Neolithicum. Het minimum aantal individuen bedraagt 58 (45 volwassenen en 13 kinderen). Zowel de kinderen als de volwassenen werden ongeacht hun geslacht en leeftijd in de grot begraven. In vergelijking met andere Neolithische stalen afkomstig uit het Maasbekken waren de individuen van Sclaigneaux van de grootsten. Bovendien vertoonden zij een goede gezondheid.

Trefwoorden: Neolithicum, antropologie, collectief graf in grot, Maasbekken, België.

The cave that is the object of this study is located 200 m SW from the station of Sclaigneaux (50°29'30"N, 5°01'20"E), less than 1 km away from Sclayn (fig. 1). It is of karstic origin. According to Arnould (1873), its volume was c. 13 m^3 and it had two entrances, opening onto the left bank of the river Meuse, about 6.70 m above the water level. For a further description of the cave, please refer to the mentioned publication.

In 1872, a team directed by the amateur archaeologist, M. G. Arnould, excavated the cave and its collective burial. The human and animal remains and the archaeological artifacts were briefly described by Arnould in 1873. The human remains including sixteen more or less complete skulls were the subject of a publication by Houzé (1903). This author estimated that about 50 individuals were buried in the cave. He made a detailed description of the skulls and provided tables with their measurements. He gave stature estimation averages for 10 males and 3 females (tab. 1). He also mentioned some pathological cases.

The collection belongs to the Archaeological Museum of Namur and is stored at the Royal Belgian Institute of Natural Sciences, where the thought of a more detailed analysis originated.

No stratigraphic divisions could be made, as the bone material was found upon the cave floor, already mixed itself and with general litter (the cave having been accessible to the public). Nowadays the entrances are obstructed by the dwellings of adjoining occupants. Thus a renewed study of the cave is for the moment

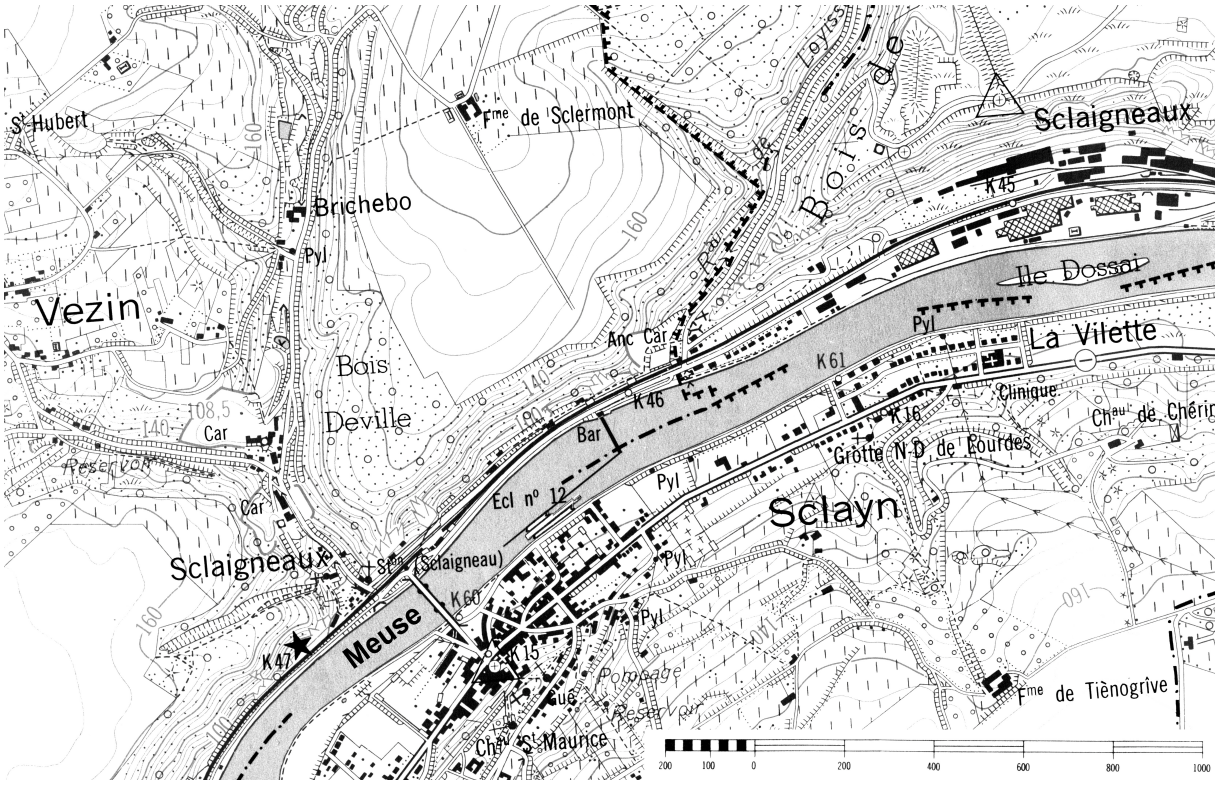

Fig. 1 – Location of Sclaigneaux cave (★). IGM map (1:10,000), Andenne 48/1 (1963).

impossible. Furthermore, we surmise that over the years it has already been completely emptied out.

^{14}C-dating of a human tibia fragment (GrA-32975) brought it back to 4155 ± 35 BP, becoming 2880-2620 BC after calibration with OxCal program. This corresponds to the start of the Late Neolithic Period (*Seine-Oise-Marne* civilization) which coincides with the dates for the majority of other known collective graves in the Belgian Meuse basin (Cauwe, 1989; Toussaint *et al*., 2001). The contemporary cultural content of the cave exists solely in the form of an arrowhead and a few flint stones. More recent objects include six potsherds (believed to be mediaeval; A. Hauzeur, pers. com.) and an iron horseshoe.

Besides human remains, the bone assemblage also includes a large amount of - also mostly fragmented - animal bones, comprising diverse groups of mammals, fish, frogs and birds (Arnould, 1873). Most animals either match the typical (late-) intrusive pattern or denote human consumption. A new study is certainly useful, since this material has not been re-examined since the 19th century.

The total number of human bone fragments that were found, and hence included in our research, exceed 6,000, along with 1,144 teeth (462 still in the jaws).

The minimum number of individuals (MNI) subdivides into 45 adults, based on the amount of axis vertebrae (fig. 2a) and into 13 children, based on the number of clavicles and of non-matching skull fragments (fig. 2b). With a total of 58 individuals, Sclaigneaux is characterised by an unusually high MNI. There are only two other known Belgian Neolithic graves which contain an almost similar amount: *La Cave* in Maurenne (with 56 individuals; Vanderveken, 1997) and *Bois-Madame* in Burnot (57 individuals; Dumbruch, 2003).

Due to severe fragmentation, no pelvic bones could be used for the gender determination. The long bones were sexed via the methods described in Krogman & Işcan (1986), the mandibles and the skulls through the qualitative method of Ferembach *et al*. (1979). We also applied the mathematical method of de Paiva and Segre (2003) for the mastoid process. This latter method was recently tested and improved by Polet *et al*. (2005). The juvenile mandibles were sexed using the method of Schutkowski (1993). Four out of five bone types (femurs – N = 12, humeri – N = 7, mandibles – N = 13 and skulls – N = 10) indicate that there were more male than female adults. Only the tibia (N = 29) seemed more female, for 79.3 %. We were able to determine the sex of twelve of the thirteen children: 58.4 % of them turned out to be female. The sex ratio of the children is thus relatively even. We can also conclude that both the

		Average stature (in m)			
		Men	Women	Method	Reference
Measured statures	*Extant national populations (20th century)*				
	Belgium	1.75	1.64		Vercauteren, 1984
	Denmark	1.79	1.67		Eveleth & Tanner, 1990
	France	1.75	1.63		Eveleth & Tanner, 1990
	Ireland	1.76	1.63		Eveleth & Tanner, 1990
	Netherlands	1.81	1.68		Eveleth & Tanner, 1990
	Norway	1.80	1.67		Eveleth & Tanner, 1990
Estimated statures	*Neolithic samples*				
	Awirs (prov. Liège)	1.66	1.52	Manouvrier, 1893	Fraipont, 1897
	Docteur (prov. Liège)	1.56	1.52	Manouvrier, 1893	Fraipont, 1897
	Falhise (prov. Liège)	1.61	1.52	Manouvrier, 1893	Fraipont, 1897
	Hastière (prov. Namur)	1.63	1.56	?	Houzé, 1904
	Hermitage (prov. Liège)	1.66	1.52	Manouvrier, 1893	Fraipont, 1897
	Modave (prov. Liège)	1.65	1.52	Manouvrier, 1893	Fraipont, 1897
	Préalle (prov. Liège)	1.62	1.53	Manouvrier, 1893	Fraipont, 1897
	Sandron (prov. Liège)	1.61	1.53	Manouvrier, 1893	Fraipont, 1897
	Sclaigneaux (prov. Namur)	1.61	1.51	?	Houzé, 1903
		1.69	1.60	femur Formicola & Franceschi, 1996	This study
		1.70	1.62	tibia Formicola & Franceschi, 1996	This study
		1.67		humerus Formicola & Franceschi, 1996	This study
	Waulsort (prov. Namur)	1.63	1.58	Trotter & Gleser, 1952	Bléro, 1997a, b
	Extant population († 1931)				
	Schoten (prov. Antwerpen)	1.67	1.60	Trotter & Gleser, 1952	Bléro, 1997a

Tab. 1 – Averages of measured and estimated statures from extant and Neolithic populations.

children and the adults of the Sclaigneaux sample were buried in the cave, whatever their gender.

To quantify the stature, of our sample, we needed to reconstruct the original length of the long bones, since most of them were fragmentary. To estimate the long bones length, we used the regression formulae of Polet *et al*. (1991) and Steele (1970). The equations of Formicola & Franceschi (1996) developed for European Neolithic individuals helped us to calculate the body heights. Also, Byers *et al.* (1989) provided us with a direct relation between the length of metatarsals I and the stature.

The average height for males estimated from the femur is 168.8 cm (N = 5), 170.0 cm for the tibia (N = 2) and 167.1 cm for the humerus (N = 5). The averages for women are analogously 160.3 cm for the femur (N = 2) and 162.3 cm for the tibia (N = 7). Our estimations are higher than those calculated by Houzé (1903). However, Houzé's averages were not reliable because they were calculated on the basis of estimations made from different types of bone (an individual could therefore have been included several times in the average calculation).

A comparison with published results of other Belgian Neolithic sites clearly shows that our Sclaigneaux stature estimations are the tallest, approaching the average heights of the extant European inhabitants (tab. 1). To avoid the bias linked to the method selected for stature estimation (tab. 1), we also compared raw data, *i.e*. long bone lengths. We chose the metatarsals I because they are plentiful and often intact. In comparison with 86 other Neolithic individuals from the Meuse Basin, the individuals from Sclaigneaux are indeed amongst the tallest (fig. 3).

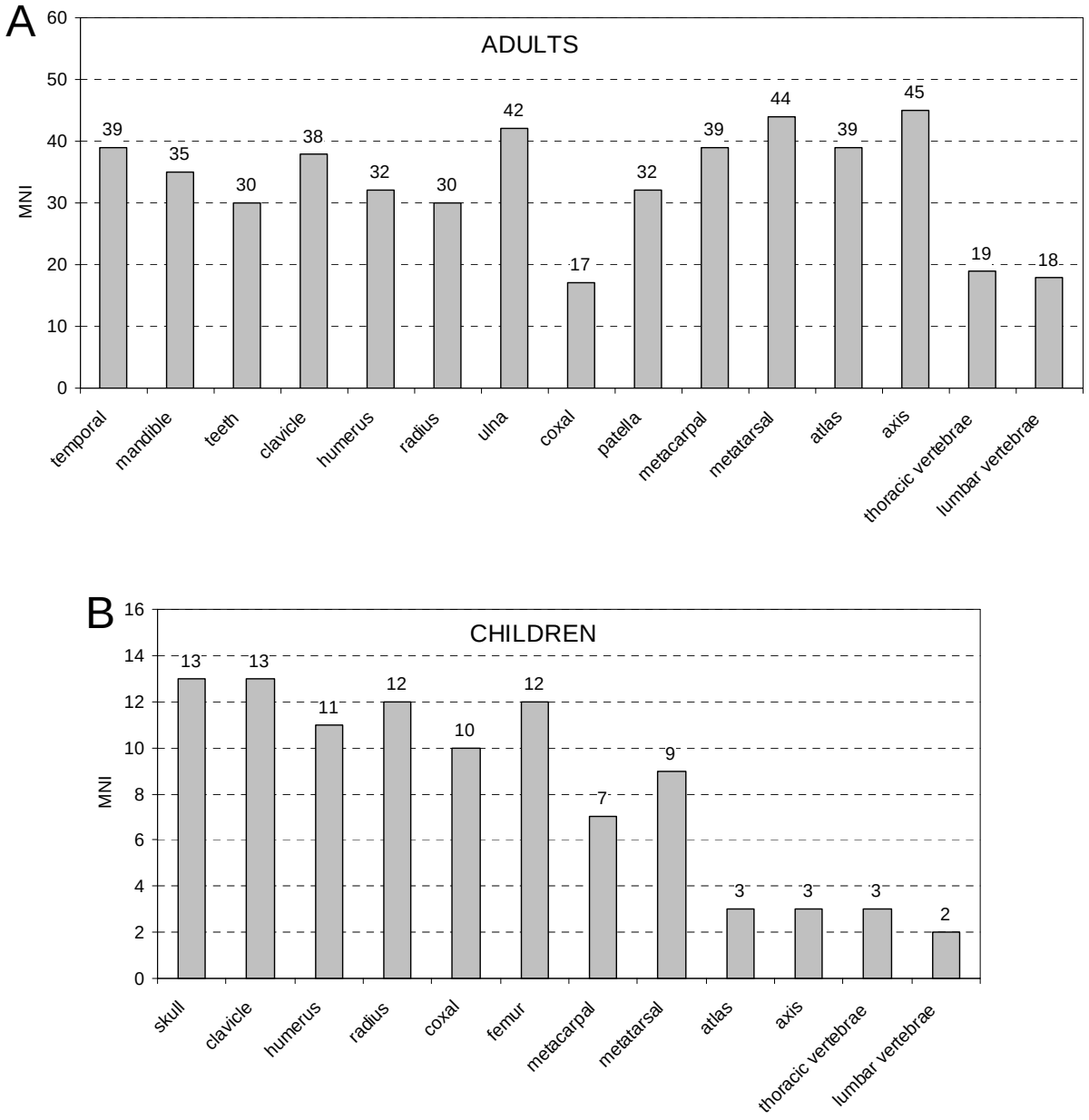

Fig. 2 – Minimum number of individuals (MNI) following bone types for the adults (A) and the children (B) of Sclaigneaux.

Age estimation was performed through the analysis of the state of closure of the cranial sutures (Meindl & Lovejoy, 1985) and by means of the modifications of the pubic symphysis (Brooks & Suchey, 1990). Only 8 adult skulls and 3 pubic symphyses could be studied. The skulls belong to 2 young adults, 1 young-middle-aged adult, 2 middle-aged adults and 3 old adults. The 3 symphyses can be attributed to 2 young and 1 middle-aged adults.

The age of the children was estimated on the basis of dental calcification and eruption stages (Ubelaker, 1989) and long bones dimensions (Alduc-Le Bagousse, 1988; Scheuer & Black, 2000). The 13 children range from 36 weeks *in utero* (based on tibia length) till 15-20 years (based on dental eruption).

Finally, we studied two non-specific stress indicators indicating good or bad life conditions during growth (Goodman & Rose, 1990; Stuart-Macadam, 1992): *cribra orbitalia* (lesions of the roof of the orbit which has been associated with anaemia) and enamel hypoplasia (defect resulting from incomplete formation of the enamel matrix mainly due to illness and/or malnutrition during tooth formation). No *cribra orbitalia* were found. Only two occurrences of enamel hypoplasia

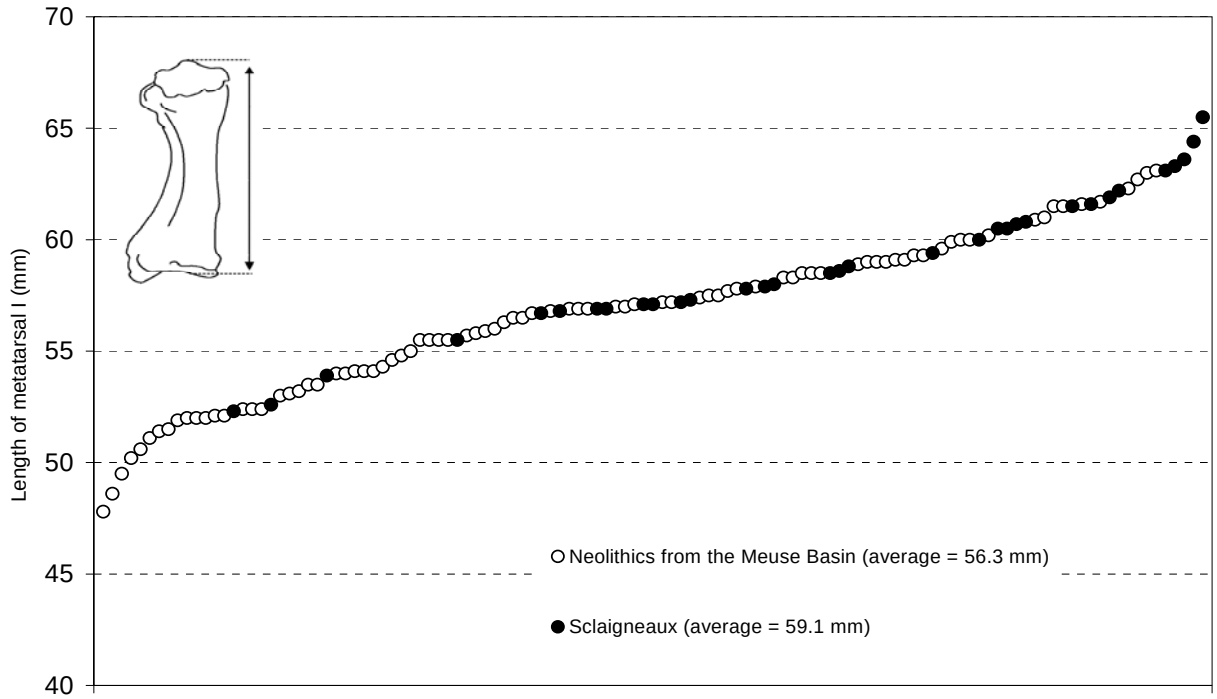

Fig. 3 – Length of metatarsal I sorted in ascending order for 86 Neolithic individuals from the Meuse Basin and 33 individuals from Sclaigneaux (left metatarsal I).

were identified on 916 permanent teeth (0.22 %). These low levels of stress markers show that the Sclaigneaux population was in good condition during its life.

The lack of information about the context of the findings unfortunately avoid us to study such themes as the distribution of the individuals throughout the cave, or whether they might have undergone any ritual treatments (specifically those not leaving evidence on bones).

Nevertheless, we showed that the Neolithic individuals buried in Sclaigneaux cave were numerous, in good state of health and tall.

Bibliography

ALDUC-LE BAGOUSSE A., 1988. Estimation de l'âge des non-adultes: maturation dentaire et croissance osseuse. Données comparatives pour deux nécropoles médiévales bas-normandes. In: *Anthropologie et Histoire ou Anthropologie Historique ?* Actes des 3èmes Journées Anthropologiques. Notes et Monographies Techniques du C.R.A., 24, Éditions du CNRS, Paris: 81-103.

ARNOULD M. G., 1873. Sur la grotte de Sclaigneaux. In: *Compte rendu du Congrès International d'Anthropologie et d'Archéologie préhistoriques* (6e session, Bruxelles, 1872): 370-381.

BLÉRO P., 1997a. *Étude de neuf ensembles sépulcraux néolithiques de Waulsort (province de Namur, Belgique)*. Mémoire de Licence, Université Libre de Bruxelles, Faculté de Philosophie et Lettres: 127 p.

BLÉRO P., 1997b. Peut-on tirer parti des collections anciennes ? L'exemple de l'étude des ossements humains de la caverne O (Waulsort, Namur). *Notae Praehistoricae*, 17: 169-176.

BROOKS S. & SUCHEY J. M., 1990. Skeletal age determination based on the os pubis: a comparison of the Acsadi-Nemeskéri and Suchey-Brooks methods. *Human Evolution,* 5 (3): 227-238.

BYERS S., AKOSHIMA K. & CURRAN B., 1989. Determination

of Adult Stature from Metatarsal Length. *American Journal of Physical Anthropology,* 79: 275-279.

CAUWE N., 1989. Les Sépultures Néolithiques en Grottes de Belgique. *Archéo-Situla,* 3: 2-5.

DE PAIVA L. A. S. & SEGRE M., 2003. Sexing the human skull through the mastoid process. *Revista do Hospital das Clínicas* (FMUSP), 58: 15-20.

DUMBRUCH I., 2003. *Étude du suite de l'abri-sous-roche du «Bois-Madame», Néolithique, à Arbre, dans la vallée du Burnot (Province de Namur). Etude anthropologique et archéologique*. Mémoire de Licence, Université Libre de Bruxelles, Faculté de Philosophie et Lettres: 134 p. + 223 p. annexes.

EVELETH P. & TANNER J., 1990. *Worldwide variation in human growth*. Cambridge University Press, Cambridge: 397 p.

FEREMBACH D., SCHWIDETZKY & STLOUKAL M., 1979. Recommandations pour déterminer l'âge et le sexe sur le squelette. *Bulletins et Mémoires de la Société d'Anthropologie de Paris,* 6 (XIII): 7-45.

FORMICOLA V. & FRANCESCHI M., 1996. Regression Equations for Estimating Stature from Long Bones of Early Holocene European Samples. *American Journal of Physical Anthropology,* 100: 83-88.

FRAIPONT J., 1897. Les Néolithiques de la Meuse (types de Furfooz). *Bulletin de la Société d'Anthropologie de Bruxelles*, 16: 311-391 + 10 pl.

GOODMAN A. H. & ROSE J. C., 1990, Assessment of systemic physiological perturbations from dental enamel hypoplasias and associated histological structures. *Yearbook of physical Anthropology*, 33: 59-110.

HOUZÉ É., 1903. Les Néolithiques de la Province de Namur. In: DE PIERPONT E. (ed.), *Compte rendu du Congrès de la Société archéologique de Namur* (Dinant, 9-13 août 1903): 305-428.

HOUZÉ É., 1904. Crânes et ossements des cavernes sépulcrales néolithiques d'Hastière. *Bulletin de la Société d'Anthropologie de Bruxelles*, 23, Mém. III: 54 p.

KROGMAN W. M. & IŞCAN M. Y., 1986. *The Human Skeleton in Forensic Medicine*. Springfield, Illinois, Charles C. Thomas ed.: 337 p.

MANOUVRIER L., 1893. La détermination de la taille d'après les grands os des membres. *Mémoires de la Société d'Anthropologie de Paris*, 4 (2e série): 347-402 + 6 tabl.

MEINDL R. S. & LOVEJOY C. O., 1985. Ectocranial Suture Closure: a revised method for the determination of skeletal age at death based on the lateral-anterior sutures. *American Journal of Physical Anthropology,* 68(1): 57-66.

POLET C., LEGUEBE A., ORBAN R. & LAMBERT G., 1991. Estimation de la stature de la population mérovingienne de Torgny. *Anthropologie et Préhistoire*, 102: 111-123.

POLET C., GILISSEN E., VERCAUTEREN M. & ORBAN R., 2005. Fiabilité de la méthode de détermination du sexe à partir de la mastoïde, selon Saavedra de Paiva et Segre. In: *Actes du XXVIIe Colloque du Groupement des Anthropologistes de Langue Française (GALF)*, Toulouse, 26-28 mai 2005: abstract.

SCHEUER J. L. & BLACK S. M., 2000. *Developmental Juvenile Osteology*. Academic Press, London: 587 p.

SCHUTKOWSKI H., 1993. Sex Determination of Infant and Juvenile Skeletons: I. Morphognostic Features. *American Journal of Physical Anthropology,* 90: 199-205.

STEELE D. G., 1970. Estimation of Stature from Fragments of Long Limb Bones. In: T. D. STEWARD (ed.), *Personal Identification in Mass*, Washington, National Museum of Natural History, Smithsonian Institution: 85-99.

STUART-MACADAM P., 1992, Porotic hyperostosis: a new perspective. *American Journal of physical Anthropology*, 87: 39-47.

TOUSSAINT M., ORBAN R., POLET C. SEMAL P., BOCHERENS H., MASY P. & GARCÍA MARTÍN C., 2001. Apports récents sur l'anthropologie des Mésolithiques et des Néolithiques mosans. In: N. CAUWE, A. HAUZEUR & P.-L. VAN BERG (eds), *Préhistoire en Belgique* (= *Anthropologica et Præhistorica*), 112: 91-105.

TROTTER M., & GLESER G. C., 1952. Estimation of stature from long bones of American Whites and Negroes. *American Journal of Physical Anthropology*, 10: 463-514.

UBELAKER D. H., 1989. *Human skeletal remains. Excavation, analysis, interpretation*. Washington, Taraxacum, 2nd edition: 172 p.

VANDERVEKEN S., 1997. Les ossements humains néolithiques de Maurenne et Hastiére (Province de Namur). *Notae Praehistoricae,* 17: 177-184.

VERCAUTEREN M., 1984. Évolution séculaire et normes de croissance chez des enfants belges. *Bulletin de la Société royale belge d'Anthropologie et de Préhistoire*, 95: 109-123.

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