

Vertesszöllös and the Presapiens Theory

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ABSTRACT The Presapiens theory, suggesting completely separate lineages leading to Neandertals and to *Homo sapiens*, has recently received a number of setbacks. However, the discovery of two hominids at Vertesszöllös could be corroborating evidence. The teeth of the first individual were described as those of *Homo erectus*, as were most features of the second, represented by an occipital. The two main characteristics used to support the *Homo sapiens* classification of the second individual are the long lambda-opisthion chord and the high cranial capacity, based on a regression using the lambda-opisthion chord. However, the real position of lambda is obscured by the presence of wormian bones, and the regression used to predict capacity was derived from a sample with more Neandertals than *Homo erectus* specimens. A comparative treatment of the morphological features and recalculation of the regression suggests that separating the occipital from *Homo erectus* is not justified. Other evidence indicates *Homo erectus* specimens as big as Vertesszöllös 2. It is unlikely that two hominid lineages occur in the Mid-Pleistocene.

The "Presapiens" theory, as described by Vallois ('58), suggests that *Homo sapiens* originated as a distinct lineage, completely separate from that which led to the Neandertals. Unlike the "Preneandertal" theory, the presapiens theory holds that this divergence took place before the Mindel/Riss Interglacial, if not before the Mindel glaciation itself.

The theory has suffered a number of serious setbacks, beginning with the demise of Piltdown (Weiner, Oakley and Le Gros Clark, '53). The sapient qualities of the Swanscombe cranium have been severely questioned. Stewart ('64) demonstrated that the occipito-mastoid torus is far more like that of Neandertals than it is like anatomically modern *Homo sapiens*, complementing Morant's original description ('38) of the cranium as platycephalic with a low and posterior position for the greatest parietal breadth. Morant also showed that the occipital breadth was completely outside the range of population variation in anatomically modern *Homo sapiens*, and more than three standard deviations from the mean. As both Sergi ('62) and Brace ('64) have indicated, these are distinctive features of *Homo erectus* and Neandertals, and can be used to differentiate these groups from modern man. Finally, Roginskii ('48) used a sim-

ple Chi-square test to demonstrate that the combination of Swanscombe features in modern man has a probability of less than 0.001, while these same features fall completely within Neandertal ranges. Thus, Swanscombe evinces characteristics one would expect in a hominid morphologically transitional between *Homo erectus* and Neandertals, and not what one would expect in a hominid transitional between *Homo erectus* and anatomically modern *Homo sapiens*. Surely, the attachment available for extensive nuchal muscles suggests a Mid-Pleistocene sized face.

Using contours, chords, and arcs of Fontechevade 2 as preserved, Sergi ('62) unambiguously demonstrated its affinities with the Neandertals, rather than with modern men. Brace ('64) showed that the position of the frontal sinus, indicated by a trace on Fontechevade 2, does not preclude the possibility of a well-developed supraorbital torus, based on the position of the sinus in Krapina frontal number 2, a Neandertal specimen with a well-developed torus. I have studied casts of Fontechevade 1 and 2. The larger fragment, 2, gives the general appearance of a Neandertal. The contour in *norma verticalis* is teardropped, with the greatest breadth well back on the parietals, close to the position of asterion. The biasterionic

breadth is even greater than Swanscombe and is close to the Neandertal mean (Vallois, '58: 83). In *norma occipitalis*, the cranial contour is almost perfectly circular, as in the Western European Würm Neandertals. I carefully compared Fontchevade 1, the small fragment of frontal surrounding the region of glabella, with casts of numerous Neandertal crania. The glabellar area of Fontchevade 1 is identical to the corresponding areas in Neandertal crania from Gibraltar and Le Moustier. Neither specimen from Fontchevade gives indication of being anything but a Neandertal.

Thus, the separation from Neandertal ancestry or status of the only two "certain Presapiens" accepted by Vallois in 1958 is without compelling substantive basis. Even still, the "Presapiens" Theory has gained new supporters in the last decade. Howell ('60) attempted identification of two hominid lineages during Mindel. More recently, Briggs ('68) suggested separation of the Ternifine mandibles into "paranthropoid" (number 3) and "telanthropoid" (numbers 1, 2) groups. Collins ('69) attempted establishing a number of lineages from Mindel and earlier, based on (apparently somewhat shaky) archaeological and morphological evidence. However, none of these proposals has been generally accepted, even by authors who consider Neandertals a separate lineage (Howells, '67).

Now, new evidence is available which could support the Presapiens Theory.

Thoma ('66, '69) has used the two individuals from the site of Vertesszöllös in Western Hungary to argue for the synchronic occurrence of two hominid species: *Homo erectus* and *Homo sapiens*. The taxonomy he suggests for the individuals at this Intermindel site has raised questions of considerable interest (Howells, '66; '67: 180). Is it possible that the occipital of the second individual (Vsz. 2) represents an early specimen of *Homo sapiens*? The question has two different meanings. For those who classify Neandertals in *Homo sapiens* this is a simple although somewhat muddled terminological question for, as Eckhardt ('70) has pointed out, we have no unambiguous rules for classifying a specimen which may be a late *Homo erectus* or an early

Homo sapiens. For Thoma, and some others, the question has an entirely different meaning. Authors who consider *Homo sapiens* and Neandertals parallel but separate lineages would interpret the *Homo sapiens* classification of Vsz. 2 to mean that these lineages had separated by the time of the Mindel glaciation. The second interpretation is questioned here.

Thoma published a detailed comparison of the tooth fragments comprising the individual Vsz. 1 ('67). Two of the fragments, a lower deciduous canine and second molar, proved complete enough for comparisons using diagnostic features. These detailed comparisons, based on both morphology and multivariate statistics, utilized samples of australopithecines, *Homo erectus* from Choukoutien, Neandertals, and a number of *Homo sapiens* groups. Regarding especially the extreme caniniform character of both Vsz. 1 and Choukoutien deciduous canine 120, as well as the lingual cingulum, crown size, and lobated structure of the lingual surface, the Vsz. tooth is identical to the Choukoutien sample and different in these same features from the other groups compared. The molar seems somewhat too large for a Neandertal tooth. Thoma concludes:

... comparing the Vertesszöllös teeth with all the other Hominid groups known from homologous teeth, it is possible to find in every case morphological criteria which, combined into discriminative patterns, properly differentiate them from each other—with only the exception of *Sinanthropus* ('67: 176).

Thus, the first specimen is a *Homo erectus*, while the second, in his view ('66, '69) is *Homo sapiens*.

The "chopper-chopping tool" industries at Vertesszöllös and at Choukoutien are similar to each other (Kretzoi and Vertes, '65; Bordes, '68). This leads to the somewhat bizarre conclusion that two different hominid species are associated with a chopper-chopping tool industry at Choukoutien (*Homo erectus*) and Vertesszöllös (*Homo sapiens*) while the same two species are associated with a hand axe industry at Ternifine (*Homo erectus*) and Swanscombe (*Homo sapiens*). Because of the similarities between the industries at Vertesszöllös and at Choukoutien where a *Homo erectus* sample from the same time period occurs (Bordes, '68; Howells,

'66), and because Thoma convincingly demonstrated that *Vsz. 1* cannot be distinguished from this *Homo erectus* sample ('67), it is of some interest to examine his reasons for placing *Vsz. 2* in *Homo sapiens* ('66, '69).

In his most recent analysis, Thoma ('69) states that most characteristics of *Vsz. 2*, like *Vsz. 1*, are similar to those in *Homo erectus*. Indeed, he concludes: "The majority of gross morphological features of *Vsz. II* is Archanthropic in character" (p. 240). *Vsz. 2* shares a number of features with both *Homo erectus* and Neandertals. Complexity of the *Vsz. 2* sutures at the metasternionic angle and the variations described for the cruciform eminence and the sinus grooves occur in almost all hominid taxa. The small cerebellar fossae compared to the cerebral fossae are also characteristic of the Peking crania (Weidenreich, '43: 40) and the Solo and other Neandertal crania as well (Weidenreich, '51: 26). If anything, these fossae seem more nearly equal in size in the Swanscombe occipital. The size relation in anatomically modern *Homo sapiens* is the opposite. Inion is about 25 mm above the internal occipital protuberance. This distance can be matched in other *Homo erectus* crania as well as in Neandertal crania. Weidenreich suggests that the separation occurs because the cerebellar fossae are small ('51: 26), but the height of the nuchal torus, and the very great extent of the nuchal musculature implied, could be another factor. Measurements of thickness are completely within both *Homo erectus* and Neandertal ranges of variation, but often fall outside the range of variation of anatomically modern *Homo sapiens*. The inion angle of the occipital is quite low, falling again within *Homo erectus* and Neandertal ranges of variation.

Other features, however, place the occipital squarely with *Homo erectus*, and distinguish it from Neandertals and other early European crania such as Swanscombe and Steinheim. The occipital torus is prominent and extends laterally across the entire bone in the fashion of almost every other *Homo erectus* specimen, and unlike australopithecines, Neandertals, modern men, and the other two early European crania. This torus is pictured

in the excellent series of figures published by Thoma ('66), in which the lateral view, his figure 3, is upside down. The nuchal plane itself is huge, attesting to the presence of a very heavy neck musculature. On the internal surface, the transverse sulcus passes directly to the temporal in *Vsz. 2*, and in Peking 12 and Java 4 as well. In Swanscombe, however, the sulcus passes to the parietal, as is the case in anatomically modern *Homo sapiens*.

The Vertesszöllös individual was probably quite large, and, based on the robustness of the nuchal muscle attachments, was probably a male. The total morphological pattern is far more similar to that of known large *Homo erectus* specimens than it is to large Neandertals. Unfortunately, the two somewhat later crania, Swanscombe and Steinheim, are quite possibly female. Thus comparisons could be somewhat misleading since gracile features due to grade cannot easily be distinguished from those due to sexual dimorphism.

In contrast, the reasons for placing the occipital in *Homo sapiens*, Thoma's "Paläanthropus" grade, are few indeed. Thoma ('69) claims only two: a high and fairly curved profile of the upper part of the occipital squama projected in the sagittal plane, and a cranial capacity significantly greater than that of *Homo erectus*.

The sagittal curvature of the upper part of the squama is indicated by the index of the lambda-inion arc to the lambda-inion chord. In *Vsz. 2* this index is 108.2; a sample of 9 *Homo erectus* specimens average 105 and range from 102.3 to 108.4 (SD = 1.8). One *Homo erectus* specimen, Olduvai hominid 13, has a greater curvature (108.4). The curvature in Java 1, the specimen with the next highest index (107), is almost as great.

The high profile of the upper part of the squama is misleading. Actually, the angle at inion is not particularly great. Its value, 103°, is equal to or less than those of almost every occipital in the Peking group, and is considerably smaller than the angle in Swanscombe (118°), a more recent European specimen. The upper squama matches Peking crania such as ten quite well in sagittal profile, except for the fact that it extends more

anteriorly, and consequently is higher. However, there are wormian bones in the vicinity of lambda which make it impossible to determine exactly where lambda is. Thoma chose the most anterior point whereas Martin ('22: 614) suggests the point where lines smoothly approximating the course of the lambdoidal suture cross each other. This point is more posterior, and consequently lower, in the Vs. 2 occipital. Use of the proper point would diminish the two chords which now fall outside of the *Homo erectus* range by being too large: lambda-inion and lambda-opisthion.

There have been several reconstructions of the lambda-opisthion chord. In the original specimen, deformed in the lambda region, a value of 106 mm was obtained. Thoma's reconstruction of the lambda region yielded a measurement of 102 mm. Tobias's reconstruction of the lambda region, reported in a publication by Thoma ('69), allowed a measurement of 100 mm. When I examined a cast of Vs. 2 at the Harvard Peabody Museum, I approximated the position of opisthion using the occipital morphology of Swanscombe as a model. This gave a measurement of 99 mm. The value based on Tobias's reconstruction is used throughout this paper.

Thoma estimates the cranial capacity of Vs. 2 by means of a regression equation relating the lambda-opisthion chord to cranial capacity. Of the 12 specimens he used, only five were *Homo erectus*. With these he mixed five Solo crania, and the Swanscombe and Broken Hill specimens. He conservatively uses the lower 95% confidence limit ('69) concluding that the capacity must be greater than 1400 cm³, using his lambda-opisthion measure of 102 mm, or greater than 1350 cm³, using Tobias's measure of 100 mm.

I separately calculated regressions for *Homo erectus*, Neandertals, and 200 *Homo sapiens* specimens representing a world-wide distribution chosen at random from publications in Biometrika (Benington, '11; von Bonin, '36; Fawcett, '01; Hooke, '26; Thomson, '16). Of the seven *Homo erectus* specimens for which the appropriate data are preserved (see table 2), the positions of opisthion were uncertain in Java 1 and 6 and have been

estimated in the literature. Regressions were calculated for the *Homo erectus* sample both with and without these specimens. The equations and correlations are given in table 1. The percentage error of regression fit is the average absolute difference between the actual and calculated cranial capacities for the sample, expressed as a percentage of the actual capacity.

The correlation for the regression using the smaller (unestimated) *Homo erectus* sample alone is greater than Thoma's correlation of 0.93 for his entire sample. The correlation value for Neandertals is lower, but this calculation used all of the published Neandertal measurements (n = 14), instead of only a few (n = 6).

Table 2 indicates a test of the regressions by predicting the known cranial capacities in the *Homo erectus* sample. The percentage error for *Homo erectus* both with and without the two approximated specimens is close to 4%. On the other hand, the percentage error of Thoma's equation when used to predict only the capacities for *Homo erectus* is twice as great. The percentage error of Thoma's equation used to predict only the five specimens for which opisthion is known with certainty is greater still, almost 10%.

The archaeological evidence, the morphology of Vs. 1 from the same site, and, by Thoma's admission, most features of Vs. 2 suggest the specimen is *Homo erectus*. Thus, it seems reasonable to use a regression based on *Homo erectus* specimens to estimate its cranial capacity. The regression for either sample gives almost identical estimations for Vs. 2, using Tobias's value of 100 mm for the lambda-opisthion chord. Because the actual value of the chord may be less, the estimation of about 1325 cm³ is a maximum. For instance, if the actual chord were only 1 mm shorter, the calculated capacity for Vs. 2, using the regression on the larger sample, would be 1305, 23 cm³ less. The estimated value for Vs. 2 is considerably smaller than the smallest estimate suggested by Thoma, and is even less than the low end of his range. If, instead, the Neandertal regression is used to predict the Vs. 2 capacity, the result is 1691 cm³—larger than the

TABLE 1

Comparison of regression parameters, correlation, percent error of regression fit, and sample size for the regression of the lambda-opisthion chord on cranial capacity for three hominid groups. The *Homo erectus* regression was done twice, (1) without the two specimens for which the opisthion position is approximated, and (2) with these two specimens

		Slope	Intercept	Correlation	Percent error of regression fit	Sample size
<i>Homo erectus</i>	(1)	23.77	-1052.4	0.95	3.6	5
	(2)	22.30	- 910.7	0.89	4.1	7
Neandertals		30.36	-1344.3	0.82	6.4	14
<i>Homo sapiens</i>		25.71	-1047.7	0.83	5.8	200

TABLE 2

Calculation of *Homo erectus* cranial capacities from regressions with the lambda-opisthion chord. Data for the chord comes from the literature (Weidenreich, '43, '45; Jacob, '66) and from measurements I made on the Harvard Peabody Museum cast set and the Wenner-Gren casts. The cranial capacities were published by Tobias ('67). The calculated values for Vs. 2 are based on Tobias's lambda-opisthion measurement of 100 mm (Thoma, '69). Both the absolute and percentage errors of the regressions applied to *Homo erectus* are given

Specimen	Lambda-opisthion chord	Actual cranial capacity	Calculated cranial capacity by regression:		
			Wolpoff	Wolpoff	Thoma
	mm	cm ³	(n = 5)	(n = 7)	
Java 1	78 (est)	850		822	877
2	75	775	731	753	797
4	78	750	802	822	877
6	81 (est)	975		891	957
Peking 3	84	915	944	960	1037
11	86	1015	992	1006	1090
12	87	1030	1016	1029	1117
Average absolute difference of calculated capacities from actual capacities			32	37	68
Percentage average difference			4%	4%	8%
Calculated Vertesszöllös capacity			1325	1328	1463

maximum of Neandertals used. This appears unlikely.

Is the capacity of Vs. 2 large enough to be outside of the expected range of *Homo erectus* variation? The range cannot be used because it is too large to be meaningful (± 345 cm³). The estimate is only 100 cm³ greater than the Peking 10 capacity. A *t* test comparing Vs. 2 to a sample of 12 *Homo erectus* cranial capacities (Tobias, '67) excluding the Vs. 2 value itself indicates that Vs. 2 is not significantly different from *Homo erectus* on the 5% level. Of course, along with all of the Peking crania, the capacity is within the *Homo sapiens* range of variation.

Is there reason to expect bigger *Homo erectus* crania than the ones which have

already been discussed? The answer seems to be yes. This can be seen in two ways.

First, we may use the relation of mandibular and cranial breadths to estimate the range of breadths in known individuals known from mandibles. The most lateral breadth taken across the mandibular articular area of the cranial glenoid fossae should approximate the bicondylar breadth of the mandible. My own observations indicate that the lateral interglenoid breadth is inevitably larger than the bicondylar breadth in modern apes and man, although the difference is slight. Table 3 gives lateral interglenoid and bicondylar breadths for all appropriate *Homo erectus* specimens. Two out of the five available mandibles are too big to fit any known *Homo erectus* cranium. One

TABLE 3

Distribution of three cranial breadth measures in *Homo erectus*: lateral interglenoid breadth, bicondylar breadth, and biparietal breadth. OH 13 and 16 were measured from scaled photographs published by Leakey ('66). Java 1, 3, and 6 were published by Jacob ('66). OH 9 and Java 2 and 4 were measured from the Wenner-Gren casts. Weidenreich published the Peking crania ('43) and mandibles ('36), as well as Mauer. Ternifine 3 was published by Arambourg ('63). The Ternifine 2 measurement comes from a symmetric reconstruction I prepared from plates in the Arambourg publication, and the reconstructed breadth based on the single Ternifine parietal was published by Krukoff ('67)

Specimen	Lateral Interglenoid breadth	Bicondylar breadth	Biparietal breadth
	mm	mm	mm
Olduvai 16			117
Olduvai 13			113
Olduvai 9	140		133
Java 1			126
Java 2	120		131
Java 3			128
Java 4	116		129
Java 6			128
Peking 2			132
Peking 3	132		133
Peking 10	131		138
Peking 11	128		135
Peking 12	130		139
Peking G1		146	
Peking H1		102	
Ternifine			150
Ternifine 2		132	
Ternifine 3		160	
Heidelberg		135	

of the Peking mandibles is too large to fit any complete cranium from that site, although it is possible that it would fit a reconstruction of the very large skull 5. Ternifine 3 is considerably larger than any other mandible or cranium. The cranium which fit it was probably broader than Vs. 2.

Second, we may observe the braincase breadth distribution for all of the complete and fragmentary *Homo erectus* crania. Table 3 gives biparietal breadth distribution. The Ternifine specimen was significantly broader across the parietals than any other *Homo erectus* specimen. Since the breadth is 12 mm less in the Peking cranium with the largest cranial capacity, the Ternifine capacity was probably bigger. Because this parietal belongs to a juvenile, and the Ternifine 3 mandible is adult, at least two large brained *Homo erectus* specimens occur with the others at Ternifine, and one or two (mandible G1 and skull 5) individuals from Peking probably were bigger brained than skull 10.

In sum, both individuals from Vertesszöllös evince a total morphological pattern

more like *Homo erectus* than like any other fossil hominid group. In terms of individuals, the specimens show greatest similarities to the crania from Choukoutien, probably the closest in grade, and to the cranium from Swanscombe, a likely member of the same lineage somewhat later in time. The Vertesszöllös material does not provide a good basis for the "Pre-sapiens" Theory. Instead, it supports the interpretation of a single evolving hominid lineage throughout the middle and upper Pleistocene.

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