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85. Report on Human Crania from Peat Deposits in England.

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Source: *Man*, Vol. 11 (1911), pp. 134-139

Published by: Royal Anthropological Institute of Great Britain and Ireland

Stable URL: <http://www.jstor.org/stable/2839269>

Accessed: 27-06-2016 09:15 UTC

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Physical Anthropology.

Duckworth ; Shore.

Report on Human Crania from Peat Deposits in England. By **85**
W. L. H. Duckworth, M.D., and L. R. Shore.

The anatomical and geological collections of Cambridge University contain several crania from peat deposits. Although the localities are widely separated, it seems justifiable to bring all the available specimens together for the purposes of description and comparison. This has been done in the following report. We are indebted to Professors Macalister and Hughes for permission to examine the crania herein described. The report is divided into two sections; in the first of these, the chief

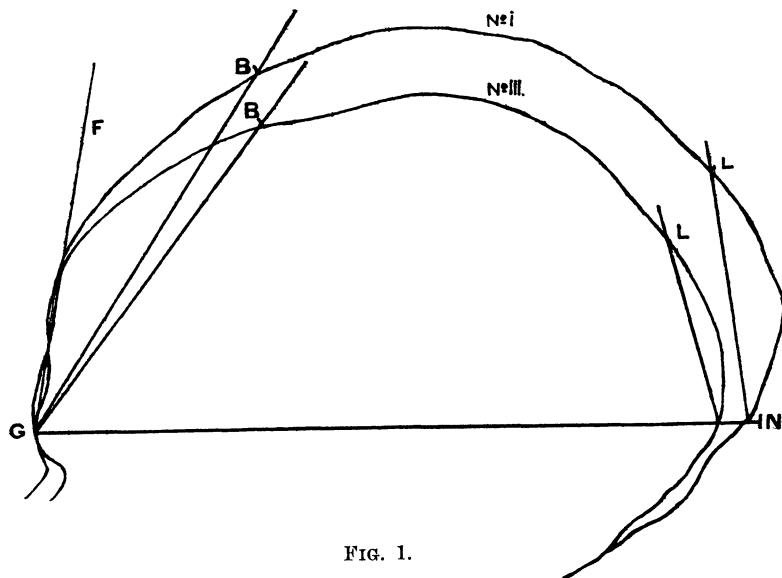


FIG. 1.
Contour tracings of crania Nos. I and III from British peat deposits. The bregmatic (B, G, IN) and lambda (L, IN, G) angles are indicated.

craniological features of each specimen are detailed; in the second part will be found comments upon the observations thus made, and the measurements and indices provided by the skulls.

SECTION I.—LIST OF THE SPECIMENS, AND BRIEF DESCRIPTIONS OF EACH.

- I. A male skull with the mandible; from Upware, Cambridgeshire.
- II. A male skull with the mandible; from Bracebridge, Lincolnshire.
- III. A female skull with the mandible; from Burwell Fen, Cambridgeshire (1890).
- IV. A male calvaria; from Burwell Fen, Cambridgeshire (1884).
- V. A male skull; from the Cambridgeshire Fens (exact locality not specified).
- VI. A fragmentary male calvaria: from Burwell Fen, Cambridgeshire.
- VII. A male skull (Mus. Anat. Cant., No. 658); from a "peat moss," Lancashire, described as "Ancient British."
- VIII. A male skull (Mus. Anat. Cant., No. 659); with locality and description as in the case of No. VII).
- IX. A male skull (Mus. Anat. Cant., No. 275); From Feltwell Fen, Norfolk, described as "Early British."
- X. A mandible, probably female; from Burwell Fen, Cambridgeshire.

No. I. A large massive male skull with prominent brow-ridges and occipital protuberance, and large mastoid processes. The principal sutures remain open. Parts of

the facial skeleton are missing. There is a well-marked supra-inial protuberance of the occipital curve, clearly shown in tracing No. I (Fig. 1) taken from this specimen. The mandible is large and heavy, though imperfect. The teeth are much worn but not carious. In length (from symphysis to angle) the mandible measures 110 mm., and in width 105 mm. at the angle.

No. II. A large male skull with prominent brow-ridges and external occipital protuberance. The chief sutures remain open. The sagittal cranial arc does not show the supra-inial bulging so distinctive of specimen No. I. Much of the base of this skull is missing. The remaining teeth are much worn but not carious. The mandible measures 94 mm. in length, and 94 mm. in width at the angle.

No. III. This skull presents features characteristic of the female sex. The brow-ridges are not prominent. The occipital protuberance is feebly developed. The sagittal arc (cf. tracing No. III, Fig. 1) shows a slight, but distinct supra-inial bulging. The parietal eminences are distinct. The facial bones are absent or greatly damaged.

No. IV. This male calvaria has been reconstructed from fragments. The face and the base are absent, as are also the temporal bones and part of the occipital bone. The brow-ridges are remarkable for their continuity in the middle line. The sagittal suture is closed. The measurement in breadth is only approximate, owing to the absence of the temporal bones.

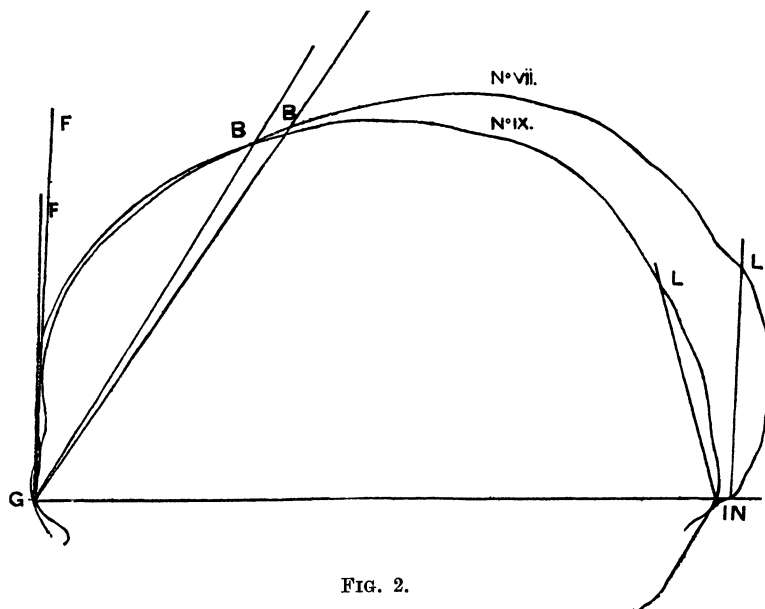


FIG. 2.

Contour tracings of crania Nos. VII and IX from British peat deposits. The bregmatic (B, G, IN) and lambda (L, IN, G) angles are indicated.

No. V. This specimen is shown to be male by the prominent brow-ridges and occipital protuberance. The face and most of the cranial base are absent. Synostosis is commencing in the external part of the sagittal suture, but has not begun in the other sutures.

No. VI. A fragmentary calvaria. The chief characteristic is the very great transverse diameter, which must have approached 160 mm., and the cephalic index was probably 90 or more. The sagittal cranial arc was evidently flattened.

No. VII. (Mus. Anat. Cant., No. 658). A male skull with prominent brow-ridges continuous across the mid-line. The mastoid processes are large, and the temporal

ridges distinct. The posterior half of the sagittal suture is closed externally. Other sutures remain open. The skull is elongated with a marked supra-inial bulging, well shown in the contour (Fig. 2). The facial skeleton is well preserved.

No. VIII. (Mus. Anat. Cant., No. 659). A male skull, very short and wide. There is no supra-inial bulging, and the median sagittal contour line ascends steeply from the inion. The parietal eminences are well developed, and give a flattened form to the cranial vault. The sagittal suture is beginning to close. The bones of the face and of the right temporo-sphenoidal region are imperfect.

No. IX. (Mus. Anat. Cant., No. 275). A very large and massive male skull of cuboidal form, resembling crania of the Gristhorpe and Cowlam types, and also to some extent the Brünn cranium. The interfrontal suture remains open (metopic). The brow-ridges and muscular impressions are prominent. The facial skeleton is well preserved, and the palate is wide and shallow. The teeth were fairly worn down but not carious. The sagittal contour is shown in Fig. 2.

No. X. A mandible of slender proportions, and apparently female. In colour it is almost black, and darker than any other of these specimens. The left ascending ramus is missing. The presence of three molar teeth show that the individual was fully adult. The measurements are :—Length (symphysis to angle), 76 mm.; depth at symphysis, 24 mm.

Measurements and Indices.—Table I contains a statement of the more important measurements and indices of the nine crania described in the preceding paragraphs.

SECTION II.

(1) In criticising this series taken as a whole, there is some reason *à priori* for considering human crania from the peat as forming a homogeneous group, since in regard to other mammalia the peat fauna is certainly a distinctive one. But a glance at this collection shows that a very great diversity of cranial form obtains.

(2) In the next place, the state of preservation of the specimens varies considerably. Nos. IV and VI, both from Burwell Fen, are distinctly more friable than the others, and thus give an impression of greater antiquity. Otherwise there is no guide whatever as to the age of the specimens, in the almost complete absence of data concerning the circumstances of their discovery. It should be noted that they might be representative of man in any stage of culture from the neolithic period to the present time. But there is no question of assigning to them a greater antiquity than that just indicated (*viz.*, neolithic).

(3) In such a case it is hardly possible to do more than provide a simple record of the chief osteological features of the crania, such as that given in the preceding section of this paper.

(4) But beyond this, it should be remarked that in respect of certain selected tests, it is possible to compare these crania with some of the classical palæolithic specimens. Such a comparison has been made, and the characters that have been employed are of a numerical order, and are considered to be of use in indicating the evolutionary grade of specimens studied by their aid.

The tests are called (*a*) the calvarial height index, (*b*) the bregmatic angle, (*c*) the lambda angle. They are well-known by reason of their employment by Professor Schwalbe in his researches on various palæolithic human remains, and especially the Neanderthal and Spy crania. Consequently they will not be further discussed in this place. The values in Tables II, III, IV provide a basis for comparisons, and here are given the figures relating to certain of the peat skulls, as determined on the tracings shown in Figs. 1 and 2. The values for the other

crania are derived from Professor Schwalbe's papers quoted by Professor Berry in the publication mentioned below.*

Put briefly, the general results of these tabulations go to show that two crania from the peat, Nos. III and IX of the series here described, tend to intrude among the early prehistoric crania. This tendency is specially characteristic of No. III, which is hereby distinguished from modern European crania, and even from some savage existing types usually assigned to a low grade of evolution. It is further to be remarked that the associated "palæolithic" crania are those known as the Galley-Hill and Brünn specimens.

Now it would be inappropriate to enter here into a detailed discussion of the possible meanings of such an association. But in this connexion it is desired to give prominence to the three statements following:—

- (a) This association is not regarded as conferring a very special distinction upon the peat-skulls concerned.
- (b) The association is with crania whose claims to that palæolithic antiquity have been to some extent "suspect." And, without embarking upon a complete exposition of evidence, we wish to state that apart from these doubts (which have not been entirely removed, even by the discussion at Paris in 1909), both specimens (viz., those from Galley-Hill and from Brünn) are open to criticism as having been partially reconstructed, while one of them (Galley-Hill) is admittedly distorted through pressure.
- (c) The association with the crania mentioned in the preceding paragraph may be claimed as corroborative of the view so ably argued by Professor Stolyhwo (*cf. L'Anthropologie*, Tome XIX, 1908, Nos. 2–3, pp. 191 *et seq.*). This observer contends that in respect of their cranial characters, *Homo primigenius* (Schwalbe) and *Homo sapiens* overlap more distinctly than Professor Schwalbe was at first inclined to admit. The characters of the Frisian skull, known as the "Batavus genuinus," support the same view, as do the data provided by a skull recently described by Duckworth in the *Journal of Anatomy and Physiology*.†

It appears, therefore, that this series of peat-crania includes examples which are somewhat unusual among modern *European* crania, in respect of the three characters employed for the purpose of comparison.

(5) Lastly, we have tested the characters of the individual crania in yet another way. This is set forth in Table V, which contains the specimens ordinated on the basis of the absolute breadth-measurement (maximum parietal breadth). The corresponding breadth-indices are also tabulated for comparison.

The table shows that while No. III, which has just been discussed, does not occupy a position of distinction, yet No. IX, which was also involved in the discussion under the previous heading (paragraph 4), is found to be rather unusually broad. And the table further shows that no less than three out of the nine crania (from the peat) present a breadth-index exceeding eighty-one. This is a percentage of 33·3, whereas among modern British crania only about ·33 per cent. should be so broad as this. The association of great breadth with great cranial capacity is clearly shown (Cf. Table I).

These specimens from the peat are therefore not a fair sample of modern *British* crania. They differ from these in respect of the exceptional position of two specimens (Nos. III and IX) described in paragraph (4) and also in the unusual frequency (one hundred times the normal amount) of occurrence of distinct brachycephalic proportions.

* Berry and Robertson, *The Place in Nature of the Tasmanian Aboriginal* (Proc. Roy. Soc., Edinburgh, Vol. XXXI, Part I., No. 3).

† Vol. XLVI, April, 1911.

HUMAN CRANIA FROM BRITISH PEAT DEPOSITS.

TABLE I.

Measurement, &c.	I.	II.	III.	IV.	V.	VII. (658)	VIII. (659)	IX. (275)
	♂	♂	♀	♂	♂	♂	♂	♂
Maximum glabello-occipital length -	199	193	185	170	194	210	176	180
Maximum breadth - - - -	143	142	141	? 133	145	144	149	152
Basi-bregmatic height - - -	141	? 135	130	—	? 130	135	?	149
Auricular height (bregma) - -	121	124	112	—	122	124	—	127
Auricular height (perpendicular) -	122	123	—	—	—	124	—	126
Horizontal circumference - -	558	545	520	—	552	552	552	534
Bistephanic breadth - - -	110	130	—	—	—	120	126	129
Bizygomatic breadth - - -	141	? 134	—	—	—	133	? 142	148
Basi-nasal length - - - -	107	?	98	—	—	104	—	110
Basi-alveolar length - - -	111	?	—	—	—	104	—	105
Nasi-alveolar length - - -	77	73	—	—	—	71	65	71
Orbital height (R) - - - -	34	33	—	—	—	32	32	32
Orbital width (R) - - - -	39	41	—	—	—	34	38	40
Nasal height - - - - -	57	51	—	—	—	47	? 52	49
Nasal width - - - - -	26	27	—	—	—	25	25	27
Cranial capacity - - - -	1,767	? 1,637	1,132	—	1,611+	1,810	—	1,800
Cephalic index - - - -	71·8	73·6	76·2	78·2	74·7	68·5	84·5	85·5
Height index - - - - -	70·8	70	70·3	—	? 67	64·5	—	83
Stephano-zygomatic index - -	78·7	94·8	—	—	—	90·2	—	87·1
Alveolar-zygomatic - - -	103·7	?	—	—	—	100	—	92
Facial zygomatic (Kollmann) -	54·6	54·5	—	—	—	53·4	45·8	48
Orbital zygomatic - - - -	87·5	80·5	—	—	—	91·5	81·5	80
Nasal zygomatic - - - -	45·6	? 53	—	—	—	53·4	48·2	55

TABLE II.

TABLE III.

TABLE IV.

CALVARIAL HEIGHT INDEX.				BREGMATIC ANGLE.				LAMBDA ANGLE.			
No.	Locality.	Index.	—	No.	Locality.	Angle.	—	No.	Locality.	Angle.	—
I.	Upware -	56.1	} Crania from Peat.	I.	Upware -	57.5	} Crania from Peat.	I.	Upware -	82	} Crania from Peat.
III.	Burwell -	48.04		III.	Burwell -	55		III.	Burwell -	75	
VII.	Lancashire -	54.3		VII.	Lancashire -	56		VII.	Lancashire -	92	
IX.	Feltwell (Norfolk)	49.2		IX.	Feltwell (Norfolk) -	59		IX.	Feltwell (Norfolk) -	75	
Comparison.*		Index.	Range.	Comparison.*		Angle.	Range.	Comparison.*		Angle.	Range.
Pithecanthropus -		34.2	40.9-47	Pithecanthropus -		37.5	45°-50.5°	Anthropoids -		55.5	43°-68°
Chimpanzee -		35.1		Chimpanzee -		39.5		Pithecanthropus -		66	
Spy-Neanderthal (3)		44.9		Spy-Neanderthal (3)		47.5		Neanderthal -		66.5	
Gibraltar -		45.4		Gibraltar -		50.5		Spy (I) -		68	
Brüx -		47.6		Brüx -		51.1		Gibraltar -		69	

* Berry and Robertson *op. cit.*

TABLE II—cont.

TABLE III—cont.

TABLE IV—cont.

CALVARIAL HEIGHT INDEX.			BREGMATIC ANGLE.			LAMBDA ANGLE.		
Comparison.*	Index.	Range.	Comparison.*	Angle.	Range.	Comparison.*	Angle.	Range.
No. III - - -	48·04		Galley-Hill - -	52		Cro. Magnon - -	70	
Galley-Hill - -	48·2		Batavus genuinus† -	52		Galley-Hill - -	74	
No. IX - - -	49·2		Brünn - - -	54		No. III - - -	75	
Cro. Magnon - -	50·0		Cro. Magnon - -	54		No. IX - - -	75	
Brünn - - -	51·2		No. III - - -	55		Brünn - - -	78	
Combe Chapelle‡	53·4(?)		Tasmanians (45) -	56	51·5°-84°	Tasmanians (46) -	80·5	74°-88°
No. VII - - -	54·3		Combe Chapelle‡	56(?)		Europeans - -	81·5	78°-85°
Kalmucks (4) - -	54·5	52·8-54·9	No. VII - - -	56		No. I - - -	82	
Batavus genuinus†	54·8		Kalmucks (4) - -	56·5	55°-57°	Canstatt - - -	83	
Tasmanians (44) -	56·1	48·3-62·7	No. I - - -	57·5		Batavus genuinus†	84·5	
No. I - - -	56·1		Dschaggas (24) -	58·6	53°-63·5°	Combe Chapelle‡	85(?)	
Veddahs (8) - -	58·4	54·6 62·9	No. IX - - -	59		Brüx - - -	90	
Canstatt - - -	59·6		Europeans (40) -	59·9	54°-68°	No. VII - - -	92	
Dschaggas (23) -	59·8	52·1-67·1	Canstatt - - -	60				
Europeans (32) -	59·8	54·4-66·2						
Remarks.			Remarks.			Remarks.		
Nos. III and IX are below the lower limit of the data for modern European crania.			The crania (I, III, VII, IX) are within the range of the data for modern Europeans.			Nos. III and IX are below the lower limit of the range of European crania given.		

* Berry and Robertson, *op. cit.*

† Schwalbe, *Globus*, Vol. LXXXI, No. 11.

‡ Kramberger, *L'Anthropologie*, 1910, p. 531.

TABLE V.

Maximum Breadth (in mm.).	Crania by Numbers.	Corresponding Cephalic Index.	Locality.	Remarks.
135-140	IV. (133).	78·2	Burwell.	Cephalic index exceeds 81 in 33 per cent. of modern British males. Cephalic index exceeds 81 in 33·3 per cent. of the crania from the peat.
140-145	I. (143).	71·8	Upware.	
	II. (143).	73·6	Bracebridge (Lincoln).	
	III. (141).	76·2	Burwell.	
	V. (145).	74·7	Cambridge Fens.	
	VII. (144).	68·5	Lancashire.	
145-150	VIII. (149).	84·5	Lancashire.	
150-155	IX. (152).	85·5	Feltwell (Norfolk).	
155-160	VI. (160).	? 91·4	Burwell.	

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