Solutrean Chronology & Lithic Variability in Vasco-Cantabrian Spain

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Resumen: Recientes excavaciones en la zona cantábrica suministran datos que apuntan a una variabilidad en las industrias del Solutrense.

Basado en pruebas de radiocarbono parece evidenciarse una contemporaneidad entre el fenómeno solutrense de la España Cantábrica y el Rhone Valley. La industria de puntas diagnostican un resultado de un proceso tecnológico convergente.

Summary: Recent excavations in Cantabrian cave deposits provide evidence of Solutrean industrial variability and provocative chronological information.

On the basis of radiocarbon there is strong evidence for contemporeanity between the Solutrean phenomena of Cantabrian Spain and in the Rhone Valley. The stone-points diagnostic would probably be the result of convergent technology.

There is considerable evidence for variability among artifacts assemblages (shown in their respective coefficients of variation). It is therefore difficult to characterize Cantabrian collections from the time range in question in a general way. It seems more fruitful to try and demonstrate the existence of functional parameters for observed artifact variability.

Recent excavations in Cantabrian cave deposits containing concave base and shouldered points provide considerable evidence of Solutrean industrial variability and provocative chronological information. Table 1 presents new radiocarbon determinations from La Riera (Posada de Llanes, Asturias) and Cueva Chufín (Riclones, Santander), together with recently published dates from the Guipuzcoan sites of Aitzbitarte, Lezetxiki and Urtiaga (Altuna 1972), Cueva Morín in Santander (González Echegaray, Freeman *et al.* 1973; Freeman personal communication), and, for comparison, the Spanish Levantine site of Parpalló (Davidson 1974) and Les Mallaetes (Fortea and Jordá 1976).

The Solutrean of Cantabria seems to date between about 21,000 and 17,000 b.p. although, except for the Riera Level 11 date, there is a gap in the radiocarbon record until about 15,500 b.p., when there is a cluster of dates from so-called Lower/Middle Cantabrian Magdalenian levels at Altamira, El Juyo and La Lloseta. As was the case with the late Levantine Solutrean (Davidson 1974), most of the Cantabrian Solutrean levels also postdate the classic Dordogne sequence, dated at the site of Laugerie-Haute between about 21,000 and 19,500 b.p. On the basis of radiocarbon determinations recently compiled by Delibrias and Evin (1974), there is strong evidence for contemporaneity between the Solutrean phenomena in Cantabrian Spain and in the Rhone Valley sites of Oullins, Chabot and Solutré, dated between 20,000 and 17,000 b.p. This evidence tends to suggest that, rather than indicating a unified cultural tradition, the stone points diagnostic of the so-called Solut-

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rean are at least partly the result of convergent technology. Indeed the existence of regionally restricted, stylistically distinctive point types (e.g. concave base, tanged, true willow leaf, Montaut) supports this conclusion.

(ISS = percentage of type 77), and a backed bladelet index (IBB = percentage of types 85-87-91).

Morín Level 3 is «Solutrean» by definition, and is separated from the C-14 dated «Level 5 superior» by 15 cm. thick Level 4; both the latter are

TABLE 1. RADIOCARBON DATES

Site & Level	Lab. No.	Age-years b. p.	Stage Designation
Mallaetes III	KN-I918	16,300 ± 1500	Upper Solutrean
Riera 11	GaK6448	16,420 ± 430	Magdalenian (?)
Riera 13	GaK6445	16,900 ± 200	Upper Solutrean
Urtiaga F	GrN5817	17,050 ± 140	Magdalenian (?)
Riera 13	GaK6444	17,070 ± 230	Upper Solutrean
Riera 18	GaK6446	17,210 ± 350	Upper Solutrean
Chufín 1	CSIC258	17,420 ± 200	Upper Solutrean
Aitzbitarte IV	GrN5993	17,950 ± 100	Upper Solutrean
Parpalló 4.75-5m.	BM-861	18,080 $^{+\ 850}_{-\ 770}$	Upper Solutrean
Riera 14	GaK6983	18,200 ± 610*	Upper Solutrean
Lezetxiki IIIa	WO3-4625-112	19,340 ± 780	Aurignaco-Perigordian (?)
Riera 20	GaK6447	19,820 ± 390	Upper Solutrean
Morín 5 sup.	SI-953	20,110 ± 330	Upper Perigordian
Mallaetes Va	KN-1919	20,140 ± 460	Middle Solutrean
Parpalló 6.5-7m.	BM-859	20 290 $^{+\ 900}_{-\ 800}$	Lower Solutrean
Riera 22	GaK6981	20,690 ± 810	Upper Solutrean
Riera 23,3	GaK6984	20,970 ± 620	Upper Solutrean

(* = in disagreement with stratigraphy)

There is, in addition, considerable quantitative evidence for variability amongst artifact assemblages recovered by modern excavations from levels pertaining to the period 20,000-17,000 b.p., the apparent time range of manufacture of these points in the Cantabrian region. Artifact group indices are presented in Table 2 for levels excaved at La Riera in 1976 (Clark & Straus n.d.) and at Chufín in 1974 (Cabrera n.d.), together with those of the Solutrean levels at Cueva Morín and Aitzbitarte (Straus 1974, 1975), and Level F at Urtiaga (Barandiarán & de Sonneville-Bordes 1965). Artifacts are classified according to the typology of de Sonneville-Bordes and Perrot (1954, 1955, 1956). The endscraper (IES), burin (IB), and perforator (IP) indices, as defined by de Sonneville-Bordes and Perrot (1953), are listed together with a Solutrean point index (ISol = percentage of types 69-72), an index of denticulates and notches (IDent = percentage of types 74 + 75), a sidescraper index

classified as Upper Perigordian (González Echegaray, Freeman *et al.* 1973). Level 3 must, therefore date to somewhat less than 20,000 b.p. Urtiaga Level F has been classified as Upper Magdalenian (Barandiarán & de Sonneville-Bordes 1965), but has been dated by C-14 as considerably older. It contains no harpoons according to Barandiarán (1972, 222 fn. 108). Artifact indices from it and from Riera Level 12, which overlies the uppermost Solutrean stratum (13), have been excluded from the measures of central tendancy and dispersion presented for each index in Table 2. No compatible classification of Lezetxiki Level IIIa is available, but examination of the collections has revealed no Solutrean point fragments whatsoever from this site (Straus 1974, 1975).

The wide range of relative variability for all these basic tool groups is apparent in their respective coefficients of variation. Variation in the relative frequency of Solutrean points is particularly

TABLE 2. ARTIFACT GROUP INDICES

Site & Level	Total	I ES	I B	I P	I SS	I Dent	I BB	I Sol
Urtiaga F	49	12.2	27.5	8.2	0	±6	±26	0
Riera 11	218	7.3	7.8	1.4	0.5	10.5	61.5	0
Riera 12	225	6.7	4.4	0.4	0	8.4	69.3	0
Riera 13	151	6.0	4.6	1.3	1.3	8.6	70.9	0.7
Riera 14	180	7.3	12.8	2.8	3.3	21.7	23.9	0
Riera 15	75	12.0	6.7	1.3	8.0	22.7	10.7	1.3
Riera 16	314	13.4	11.1	2.6	10.5	38.9	2.9	1.0
Riera 17	52	8.0	10.0	2.0	6.0	58.0	4.0	0
Riera 19	65	9.8	12.3	3.1	6.2	49.2	3.1	0
Riera 20	71	25.4	7.0	4.2	9.9	32.4	0	7,0
Riera 21	107	9.3	14.9	2.8	7.5	47.7	0	0.9
Riera 22	116	17.2	7.8	4.3	4.3	35.4	4.3	5.2
Riera 23	149	13.4	9.4	2.0	4.7	25.5	5.4	18.8
Riera 23.1-23.3	212	5.2	11.3	0.9	1.4	15.6	11.8	29.2
Aitzbitarte IV	332	15.3	20.7	1.8	6.6	11.8	13.1	9.6
Morín 3	138	11.6	10.1	3.6	1.5	10.9	13.8	10.9
Chufín 1	272	24.2	11.1	2.6	8.5	4.3	9.9	18.8
Mean		12.7	10.7	2.5	5.7	27.3	12.4	7.4
Standard deviation		6.2	4.0	1.1	3.1	16.7	18.1	9.1
Coefficient of variation		48.6	36.9	42.0	53.8	61.3	145.6	123.6

striking within the La Riera sequence, reinforcing the possibility that the Urtiaga F and Lezetxiki IIIa collections do indeed pertain to the 17,000-20,000 b.p. Cantabrian Solutrean time range, as their C-14 dates indicated —this despite a lack of Solutrean points and of bracketting levels containing such «fossil directors». Variation in the percentage of backed bladelets is no less marked, and suggests that high proportions of these microliths are not necessarily Magdalenian indicators, since high percentages are present in several levels also containing Solutrean points (or bracketted by such levels). An interesting near regularity is apparent in these indices in the proportional dominance by the burin group over that of the endscrapers. This is the inverse of the relationship said to be typical of the French Solutrean (Bordes 1968). Even this apparent consistency would be broken, however, if indices from other Cantabrian Solutrean collections from older excavations were introduced into the comparison (Straus 1975, 1976).

It is therefore difficult to characterize Cantabrian collections from the time range in question in a general way; not even the presence of Solutrean points is a reliable indicator of group affiliation. There is considerable evidence of similarities between artifact and faunal assemblages from levels with Solutrean points and, in some cases, those from levels called «Upper Perigordian», and, in other cases, those from levels called «Lower Cantabrian Magdalenian» (Straus 1976). The similarities in artifact representations between Riera levels 12 («Magdalenian»?) and 13 («Solutrean») likewise indicate the difficulty of assigning collections to traditional culture-stratigraphic units on the basis of supposedly distinctive assemblage types. Thus, rather than concentrating on nomenclatural problems and on the definition of normative assemblages, it is clearly more fruitful to formulate hypotheses about, and attempt to demonstrate the existence of functional parameters for observed artifact assemblage variability. Explanations couched in terms of covariations in tool kits, faunal assemblages, seasonal and environmental parameters, and/or site locations are likely to prove more satisfying than normative characterizations of culture-stratigraphic units.

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