Human morphology in Italy from the Upper Palaeolithic to the Protohistory

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1 - Introduction

Within the ambit of the project «The human population of Italy: man and environment in the past, census and analysis», this work is an in-depth study of the problem of using anatomical characteristics (of the skull and post-cranial skeleton) in analysing buried remains. As is well known, such characters are included in the wider group of anthropological variables, comprising both continuous quantitative (so-called measurable) and qualitative (so-called descriptive) characters.

The methods and instruments proposed in the literature on this subject are re-examined, and an assessment of the use of different types of variables in the characterization, identification and classification of human groups is made.

2 - Qualitative anatomical (non-metric) variables

2.1 Premise

The matter immediately appears complex: even the terminology used in the titles of articles on this subject varies.

Past anatomists, e.g., Le Double (1903, 1906, 1912) preferred to refer to these skeletal characteristics of man as «rare», «abnormal», or «encountered occasionally» variations.

The first to define them as «morphological characters», at least in the titles of his articles, was Wood-Jones (1931a, 1931b, 1931c, 1934). This definition was also used by Berry & Finnegan (1974) for human populations. The evaluation implied by this name is not neutral: the characters are qualitative and, therefore, definable in terms of their presence or absence.

In his study on experimental rat populations, Grüneberg later defined them (1952) as «quasi-continuous» and then (1954) as «minor» variations. In the title of his article on human populations, this term is given an additional qualification by Sjøvold (1973): «minor-*non-metric*» variations.

The term «epigenetic variations», used by Berry in 1963 for populations of *mus musculus*, was repeated by Berry & Berry in their article (1967) in which the classic 30 variants for human populations are defined (figs. 1-5).

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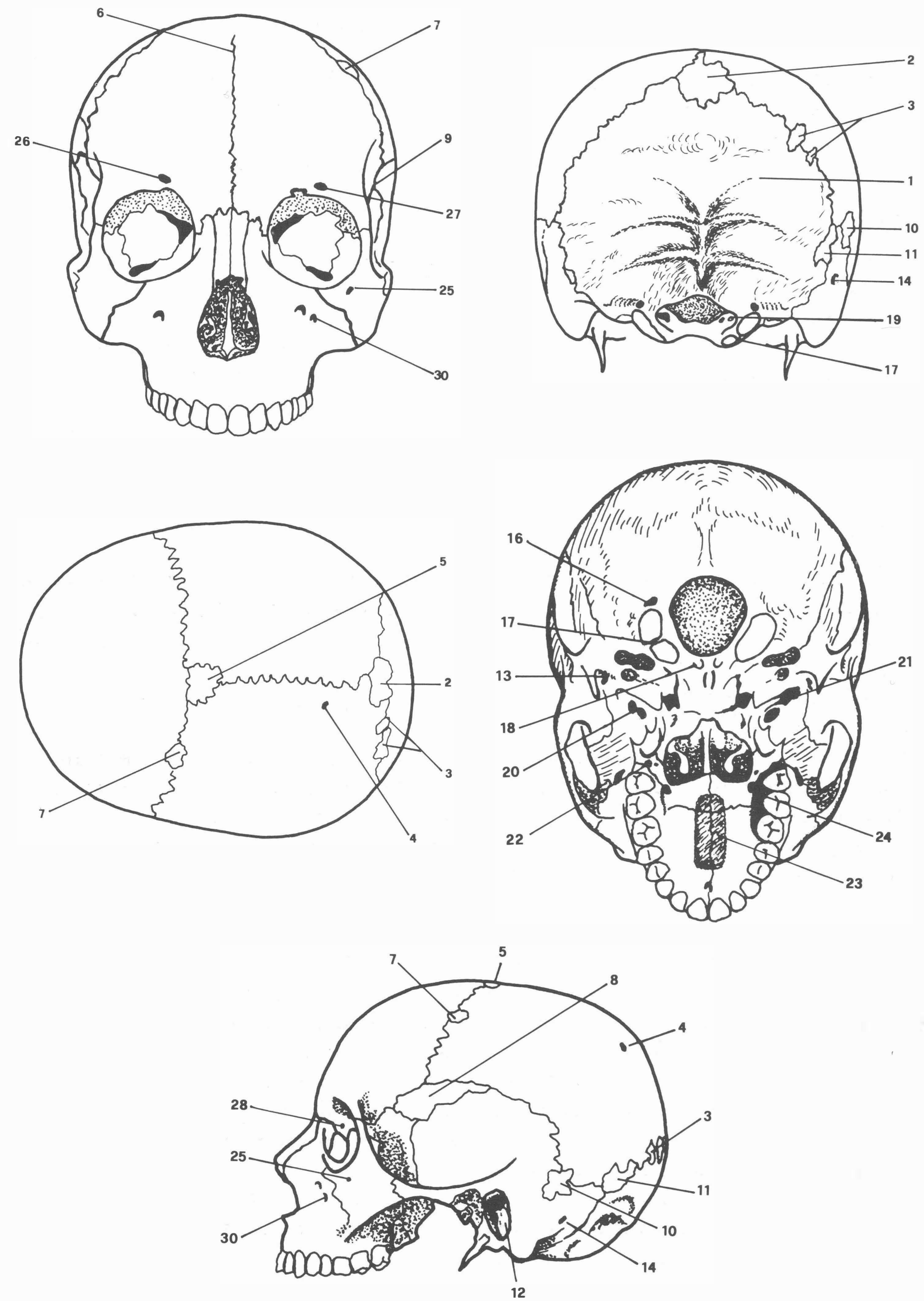

Figs. 1-5 - Location of Berry and Berry's variables considered in this research (see tab. 1).

Table 1 - List of the morphological variants considered in the text.

1) Highest nuchal line	16) Patent posterior condylar canal
2) Ossicle at the lambda	17) Condilar facet double
3) Lambdoid ossicles	18) Precondylar tubercle
4) Parietal foramen	19) Double anterior condylar canal
5) Bregmatic bone	20) Incomplete foramen ovale
6) Metopism	21) Open foramen spinosum
7) Coronal ossicles	22) Accessory lesser palatine foramen present
8) Epipteric bone	23) Palatine torus
9) Fronto-temporal articulation	24) Maxillary torus
10) Parietal notch bone present	25) Zygomatico-facial foramen absent
11) Ossicle at asterion	26) Complete supra orbital foramen
12) Auditory torus	27) Frontal notch or foramen
13) Foramen of Huschke	28) Anterior ethmoid foramen exsutural
14) Mastoid foramen exsutural	29) Posterior ethmoid foramen absent
15) Mastoid foramen absent	30) Accessory infraorbital foramen

Lastly, Ossenberg (1970) and Corruccini (1974) referred to morphological traits as «discontinuous» or «discrete», in their articles on the influence of artificial cranial deformations of these characteristics and its significance in the study of human biology.

As can be seen from this brief review, human population researchers mainly tend to use terminology («non metric», «discontinuous», or «discrete» characters) that refers qualitative characters to monomeric heredity, and always eventually implicitly accept the preponderance of genetic determination in the appearance of these morphological variants in man. Instead, researchers who have attempted to determine heredity accurately in experimental populations use the more neutral terms «minor» or more often «quasi-continuous» variations.

These variations have sometimes stimulated the interest of researchers who treated the subject in a prevalently descriptive way.

Le Double systematically studied many variations of the cranium, a great number of which are used in the present research. He surveyed and described each character, observed a considerable number of samples and undertook morphological description, in both man and other mammals. He also described the stages of development resulting in the formation of the character considered, and it is for this reason that his work still serves as a valid point of reference, since descriptive literature on the traits considered here is scanty. At the same time as Le Double, in his work on Normal Human Anatomy, Testut (1904) considered several minor cranial variations and studied the embryological aspect of the characters. This was certainly an important contribution towards the classification and standardisation of certain features.

Previous researchers, however, mainly dealt with the descriptive aspect, without using these variants in population comparisons. Following the trend at that time, Le Double used available data to discover whether any character was related to criminality.

Chambellan (1883) (reported by Berry and Berry, 1967) appears to have been the first to suggest that these morphological traits might be taken into account. Later, Russel (1900) (reported by Berry and Berry, 1967) gathered together data for numerous cranial variants in groups of Americans, and first indicated their use in the comparative study of populations. Thus, the subject is not a relatively recent innovation; at that time, however, it was only considered occasionally.

Wood-Jones later used data from several cranial variants in order to make a more systematic comparison between many ethnic groups of the Far East and Oceania. These studies were still isolated attempts and were only later systematically taken up by other anthropologists, prompted by studies aimed at substantiating the genetic hypothesis, giving a new slant to the subject.

During the period 1930-1950, other authors such as Collins (1926), Ashley-Montagu (1937), Drennan (1937), Comas (1942) and Choukè (1947) also examined one or more particular characters, for example metopism, palatine and mandibular fori, precondylar tuberculus, etc. These researchers considered the subject not only from the descriptive stand-point, but also by comparing the relative frequency of the characters considered in the different ethnic groups. Samples were usually chosen on the basis of their state of preservation (for this reason modern series were often used), of which various data such as race, sex and any diseases were known.

In the meantime, the hypothesis that some characters were controlled genetically had made headway. With a view to understanding transmission from one generation to another, Torgersen (1951), Selby, Garn and Kanareff (1955), Suzuki and Sakai (1960), among others, reported characters such as metopism, «the osseous bridge» of the atlas, and the palatine and mandibular fori in family groups.

The findings of these authors are in agreement: the presence of some of these characters is determined by a dominant gene but, adds Torgersen, «with a penetrance of about 50%» and is «expressed» in various ways. However, as these studies are limited to a small number of characters, these conclusions cannot automatically be extended to all minor variants.

The need to identify and clarify factors responsible for minor skeletal characters prompted some geneticists (Truslove 1952, 1956, 1961, 1976; Searle 1954; Gruneberg 1955; Grewal 1962; Berry 1963) to study these characteristics in rats. Their conclusions concerning genetic action on minor characters do not appear to be exhaustive. Although genetic control of the pleiotropic type (or polygenic systems at the threshold) has been verified, the mode and mechanism by which these influence phenotypic manifestations cannot therefore always be directly connected with genetic dependence. Sex also appears to be a further genetic cause of considerable importance in the appearance of some minor characters (Deol 1955; Deol *et al.*, 1957). Lastly, the following series of non-genetic factors may influence the manifestation of these variants: age of mother, duration of gestation, diet and body weight.

Concerning genetic factors influencing these variants, it is well-known that the use of terms such as penetrance, expressivity, pleiotropism and polygeny presupposes hereditary transmission definitely not of the simple type.

2.2 Methodology

In 1967, by extrapolating research undertaken mainly on animals and epistemically proposing genetic determination of the variants, Berry and Berry suggested a list of 30 characters (see tab. 1 and figs. 1-5). As, according to these two authors, «the frequency of each particular variant is constant in a given race and similar in related races, the geographical isoincidence line can be constructed for a variant in the same way that blood group frequency maps can be drawn». They proposed using the list of 30 variants to establish the «measure of divergence (between populations) that reflect the genetic differences with greater accuracy than statistics based on metric data».

The success of Berry's initial proposal may be explained by the fact that the use of the most classic - but most painstaking - metric characters is much more time-consuming than rapid classifications such as presence-absence. However, rapid classifications are inevitably summary, due to the intrinsic non-discontinuous nature of certain variants (e.g., the highest nuchal line or the different types of *torus*).

The revival of the «occasional» variants of past anatomists is, however, less comprehensible under a more critical examination of the various conditions which scientifically justify the use of multivariate statistics based upon the above characters. According to Corruccini (1974), the following are necessary:

1. Simple definition and standardisation of characters;
2. Absence of reciprocal correlations;
3. High genetic determinism;
4. Constance with respect to environmental conditions;
5. Invariance with sex and age;
6. Variations of incidence, also between related populations.

Concerning point 1, Corruccini writes: «Many workers admit occasional confusion in defining traits or drawing the dividing line between present and absent»; Ardito (1975) states: «the impossibility of comparing data collected by different researchers is still demonstrated»; more recently, Thoma (1981) stated: «it appears that the data of any two different observers are not comparable».

Concerning point 2, Corruccini again states that the intercorrelation of the characters is «low, but significant».

Points 3, 4 and 5 have already been discussed: Berry (1975) and Corruccini also admit the possibility of intersexual differences for some characters (more frequent in males: highest nuchal line, ossicle at asterion, auditory torus, precondylar tubercule, accessory frontal foramen; more frequent in females: metopism, epipteric bone, foramen of Huschke, palatine tori). Although in this respect Finnegan (1978) states that discontinuous postcranial characters are superior, he reaches the same conclusions. It is therefore reasonable to make comparisons between single sexes.

Likewise, when applied to collections of crania of a known age, the «hypothesis of age independence of discrete traits» fails and, as with sex differences, it appears «that there is no real difference between non-metric and metric variables» (Corruccini, 1974). Instead, Ossenberg (1970) points out that certain characters, such as the auditory palatine and mascellar tori, precondylar tubercule, double condylar anterior canal and complete supraorbital foramen, systematically show frequencies that are higher in older subjects: these characters are called *hyperstotic*, whereas characters like sutural ossicles, metopism, foramen of Huschke and the open spinous foramen are defined as *hypostotic*.

For a complete picture, it should be mentioned that artificial cranial deformations and some diseased states may influence the appearance of certain non-metric variants (Ossenberg 1970; Berry, 1975). Only laterality does not show significant differences in symmetric characteristics (Cosseddu *et al.*, 1979).

The last point, that the «incidence (of the variants) is a real property of the populations under consideration» (Spence, 1974), was experimentally tested by us.

2.3 Univariate analysis

We chose from the literature 130 populations from the whole world and from different epochs, starting with 4,500 B.C., in which the 30 characters of Berry and Berry had been totally or partly determined. The frequencies for each population were then computerized, together with the initial data on the basis of apparent reciprocal homogeneity (first level).

All populations were then reunited (second level), both chronologically (regrouping was necessarily quite heterogeneous) and geographically (only more modern populations).

On the basis of a criterion that allowed a representative number of populations, the following periods were identified for the second chronologic level:
1) from 4,500 B.C. to 1,400 B.C.;
2) from 1,300 B.C. to 500 A.D.;
3) from 600 A.D. to 1,400 A.D.;
4) from 1,500 A.D. to present-day (populations considered modern).

For more detailed information on the sample and for detailed tables, see a previous published work (Alciati *et al.*, 1981); here, only second geographic level (tabs. 2-6) are shown, in which modern populations are grouped according to continent.

From the paper quote above, population regrouping of the first level does not follow any definite rules. It is therefore shown that, whenever data from different operators are used, Berry and Berry's assumption, according to which it is possible to draw geographic charts like those for blood groups for each variant, is not demonstrated. Moreover, the hyperbolic values of the coefficients of variability for characters 5, 7, 9, 12, 17, 20, 23, 24 and 29 have revealed that they are unreliable.

The second chronological level regroupings (according to the four above-mentioned major periods) also revealed an irregular model of variation: i.e., with the passing of time, lines with a tendency to increase (or decrease) which appear in the frequencies of the variants considered (except perhaps for 22, 28 and 29) cannot be identified.

Only the second-level geographic regroupings (tabs. 2-6) show some discriminatory potential for continents for certain variants. *Asians,* in particular, seem to have high frequencies of characters 14, 24, 25 and 29 (and 8, 15, 18 and 28, in common with Oceanics) and the low frequency of character 4.

Table 2 - Modern populations of Europe.

	n.	$\overline{X}$	s	CV	m_o-M_o
1	15	15,6	11,0	70,5	0,3-36,0
2	16	12,2	5,6	46,3	5,0-25,1
3	16	45,3	14,6	32,2	22,8-72,3
4	16	57,7	12,3	21,3	31,0-78,0
5	15	1,2	1,3	106,8	0,0-3,6
6	16	8,9	3,6	40,0	3,3-1,8
7	15	8,8	13,6	154,8	0,0-47,1
8	16	13,8	4,7	33,9	1,9-19,2
9	16	1,3	1,6	126,3	0,0-6,3
10	16	11,3	4,1	36,8	3,4-18,0
11	16	11,3	6,5	57,6	3,6-27,6
12	14	0,3	0,8	269,4	0,0-2,8
13	16	12,1	8,5	70,1	0,1-28,0
14	16	41,2	15,1	36,5	17,8-81,4
15	16	14,8	15,3	103,4	0,0-50,2
16	16	4,2	14,5	32,0	10,1-63,8
17	16	5,8	6,6	112,9	0,0-22,2
18	16	5,8	3,7	64,4	0,0-14,4
19	15	16,9	5,7	33,9	9,5-27,3
20	16	1,4	2,0	142,8	0,0-6,8
21	16	8,9	11,5	129,7	0,0-43,2
22	16	57,4	11,2	19,5	83,9-78,4
23	16	10,2	11,0	108,5	0,0-39,0
24	16	1,4	2,1	151,6	0,0-6,5
25	16	15,1	8,6	57,3	3,3-33,9
26	16	18,3	6,1	33,2	10,7-30,6
27	15	44,0	13,2	30,1	20,5-62,0
28	16	25,6	22,9	89,4	4,2-90,8
29	16	8,5	8,3	98,5	0,0-29,3
30	16	11,3	5,2	46,1	3,2-23,2

Great Britain	3 populations	1500 A.D. - 1800 A.D.
Italy	11 populations	1700 A.D. - 1900 A.D.
Holland	1 population	1900 A.D.

Table 3 - Modern populations of Asia.

	n.	$\overline{X}$	s	CV	m_o-M_o
1	7	28,2	12,6	44,7	12,7-44,0
2	7	19,2	4,8	25,2	13,2-25,0
3	7	44,7	12,8	29,1	29,4-59,5
4	7	45,3	15,4	33,9	22,2-64,8
5	3	0,0	0,0	—	—
6	7	7,4	5,0	67,2	0,0-16,0
7	6	5,2	5,6	108,4	0,0-13,6
8	7	19,2	7,4	38,4	6,4-26,8
9	7	7,1	6,2	87,1	1,5-17,2
10	7	13,3	7,3	54,7	7,5-28,0
11	7	12,0	5,4	45,0	5,4-20,0
12	7	5,0	6,4	128,0	0,0-13,8
13	7	25,2	14,7	58,4	6,0-50,0
14	7	60,9	24,9	40,8	33,3-94,6
15	7	35,4	24,3	68,5	7,8-68,4
16	7	50,5	19,1	37,7	13,3-66,0
17	7	8,0	8,0	98,8	0,0-17,9
18	7	10,7	6,3	59,0	0,0-19,5
19	7	16,7	6,7	40,0	8,3-25,0
20	7	3,3	2,7	81,6	0,0-8,2
21	7	16,5	7,2	43,9	8,0-25,0
22	7	52,4	28,0	53,4	23,3-92,6
23	7	9,1	10,5	116,1	0,0-26,7
24	7	9,9	14,3	144,5	0,0-31,5
25	7	47,7	30,0	62,8	14,0-80,4
26	7	20,4	7,4	36,1	12,3-33,5
27	7	41,2	23,5	57,1	19,6-76,3
28	7	51,5	34,4	66,9	19,5-91,7
29	7	42,2	51,0	120,8	0,0-98,3
30	7	19,0	19,7	103,7	1,5-57,1

India	5 populations	1800? A.D. - 1900 A.D
Birmania	1 population	1800? A.D.

Table 4 - Modern populations of Africa.

	n.	$\overline{X}$	s	CV	m_o-M_o
1	2	8,5	6,9	81,2	33,6-13,3
2	3	15,3	4,7	30,8	12,5-20,7
3	9	36,1	7,4	20,4	25,9-44,6
4	9	60,1	6,3	10,8	52,5-70,6
5	2	0,0	0,0	—	—
6	9	1,6	1,6	105,4	0,0-4,4
7	2	0,0	0,0	—	—
8	9	8,6	3,8	44,3	2,2-14,8
9	3	9,3	4,2	44,9	4,9-13,2
10	9	9,5	4,8	50,6	0,0-17,1
11	3	9,8	4,0	40,5	7,0-14,3
12	8	0,1	0,4	282,8	0,0-1,0
13	9	12,9	11,0	85,3	1,0-30,4
14	3	42,4	7,4	17,4	36,9-50,8
15	3	12,5	4,4	34,8	7,5-15,3
16	3	37,1	12,2	32,8	26,8-50,5
17	3	7,2	5,6	78,4	0,9-11,8
18	3	7,0	4,6	66,2	1,8-10,7
19	3	10,6	3,6	34,0	6,6-13,6
20	3	4,4	1,2	28,5	3,6-5,8
21	3	32,0	21,6	67,5	7,1-45,6
22	3	64,5	20,3	31,5	41,1-77,6
23	9	4,9	4,9	101,6	0,0-15,4
24	9	3,0	4,6	152,9	0,0-12,1
25	9	20,8	7,7	36,9	14,3-40,5
26	9	21,3	7,8	36,6	10,6-33,6
27	3	26,5	5,0	18,8	20,9-30,4
28	3	25,0	23,3	93,3	8,0-51,6
29	3	1,6	2,7	173,2	0,0-4,7
30	9	9,4	3,0	31,7	4,9-13,8

Nigeria	1 population	1800? A.D.
Sudan	1 population	1800 A.D.
Palestine	1 population	1900 A.D.
Uganda	2 populations	1900 A.D.
South Africa	4 populations	1900 A.D.

Table 5 - Modern populations of America.

	n.	$\overline{X}$	s	CV	m_o-M_o
1	6	33,0	34,4	104,0	3,8-98,4
2	7	18,2	11,3	61,9	0,0-32,3
3	7	43,1	16,5	38,2	17,7-65,3
4	7	57,8	13,0	22,4	45,1-80,3
5	6	0,6	1,6	244,9	0,0-3,8
6	6	1,7	1,4	82,9	0,0-3,2
7	6	9,3	13,4	143,6	0,0-32,0
8	7	6,2	3,9	63,3	1,6-12,0
9	6	1,1	0,9	84,5	0,0-2,1
10	7	9,8	6,4	65,3	0,0-19,0
11	7	13,3	5,9	44,3	3,1-19,5
12	6	3,5	5,2	148,8	0,0-11,3
13	7	29,2	13,9	47,7	6,5-46,2
14	6	43,1	8,7	20,3	33,3-55,6
15	7	13,7	6,0	43,7	7,5-22,0
16	7	62,0	226,9	43,3	15,6-90,8
17	6	1,8	3,9	213,7	0,0-9,7
18	6	2,6	4,0	155,2	0,0-8,1
19	7	19,1	7,6	39,6	6,1-27,4
20	6	2,8	2,,4	83,4	0,0-6,0
21	7	15,3	7,3	48,0	5,7-25,0
22	7	55,4	18,6	150,1	0,0-34,4
23	6	9,1	13,6	150,1	0,0-34,4
24	6	0,0	0,0	—	—
25	7	21,5	11,4	53,1	0,0-32,8
26	7	43,3	9,8	22,6	30,2-53,7
27	6	44,4	23,3	52,4	17,7-83,1
28	7	45,1	25,7	56,9	11,4-78,6
29	6	3,2	4,2	131,0	0,0-11,3
30	7	15,3	9,5	62,1	6,0-35,7

Canada	3 populations	1600 A.D. - 1700? A.D.
Mexico	1 population	1700? A.D.
Perù	1 population	1700? A.D.
Northwest. Coast	1 population	1700 A.D.
Argentina	1 population	1900 A.D.

Table 6 - Modern populations of Oceania.

	n.	$\overline{X}$	s	CV	m_o-M_o
1	9	33,5	6,1	18,1	25,4-43,2
2	9	16,7	5,5	33,0	9,7-28,0
3	25	43,6	12,0	27,4	18,9-65,3
4	24	64,4	12,8	19,9	44,8-86,7
5	23	0,8	3,2	402,4	0,0-15,6
6	25	1,6	1,8	113,0	0,0-5,3
7	25	8,6	9,2	107,0	0,0-38,9
8	9	20,9	6,7	32,0	11,0-34,4
9	9	7,5	4,6	60,4	3,3-16,2
10	9	14,3	5,5	38,7	2,3-20,3
11	25	26,8	10,9	40,7	9,5-50,0
12	25	4,5	5,6	126,1	0,0-19,6
13	24	5,5	5,6	101,6	0,0-20,0
14	9	44,1	5,9	13,3	36,5-55,6
15	9	28,3	7,1	24,9	17,9-37,6
16	23	60,8	28,5	46,9	15,7-92,7
17	9	1,2	1,9	156,5	0,0-5,4
18	9	10,3	1,8	17,9	8,1-13,0
19	9	6,1	2,2	35,7	3,7-8,6
20	9	5,0	4,2	84,8	0,0-11,2
21	9	37,6	10,9	29,0	23,7-57,3
22	9	80,1	6,1	7,6	70,5-86,5
23	25	2,9	4,2	147,8	0,0-16,3
24	9	0,2	0,3	165,9	0,0-0,8
25	9	19,9	11,9	59,7	5,2-35,3
26	9	24,0	12,8	53,3	10,4-47,4
27	9	47,0	6,2	13,2	40,3-59,5
28	9	46,0	11,1	24,2	30,0-62,8
29	9	1,6	1,2	72,9	0,0-3,0
30	9	16,1	5,9	36,9	5,1-25,6

Australia	5 populations	1800 A.D.
Micronesia	5 populations	1800 A.D.
Melanesia	9 populations	1800 A.D. - 1900 A.D.
New Guinea	1 population	1800 A.D.
Polinesia	8 populations	1800 A.D.

Tabels 2-6 - Mean frequencies of characters of Berry and Berry in modern populations (from 1500 to present) considered in this research, regrouped by continent.
A list of the 130 populations considered, their geographic provenance and age, and the frequency of Berry and Berry's charachters in each population are reported in detail in a previous work (ALCIATI *et al.,* 1981.

Americans show high frequencies of characters 1, 7, 26 (and 13, 16 and 28, in common with Asians and Oceanics).

In general, *Oceanics* have high frequencies of characters 11, 21 and 22 (and 8, 15, 18, 28, in common with Asians; also 1 and 16, in common with Americans).

Europeans are characterised by low frequencies of characters 21 and 25 (1, 28 and 30, in common with Africans).

Africans are identified by their low frequency of characters 3, 16 and 27 (and 1, 28 and 30, in common with Europeans) and high frequency of character 21.

Lastly, about two-thirds of the characters of Berry and Berry appear to have a certain degree of discriminatory potential, at least in large geographic areas like continents. The behaviour of some of these characters groups together Asians and Oceanics on one hand (and near them Americans) and Europeans and Africans on the other (fig. 6). This observation is in agreement with the dendrograms obtained by THOMA (1974) and MAYR (1976) (both reported by THOMA, 1981), based on the world-wide distribution of dermatoglyphic and HLA system characters respectively; these dendrograms (fig. 7) may have phylogenetic significance.

There is an analogy in the positions of the «major races» in figs. 6 and 7. In fig. 6 in particular, Asians and Americo-Oceanics regroup (characterised by the high frequency of 16 variants), while Euro-Africans plot in another part (low frequency of 8 variants): in particular, the behaviour of four of these variants (1, 16, 25 and 28) differ in the two groups.

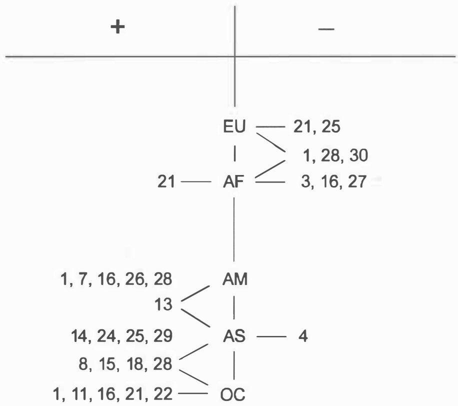

Fig. 6 - Diagram summarizing behaviour of some variables in «major geographical races» described in text. Numbers individuate variables; signs + and — indicate high and low frequency of variants respectively.

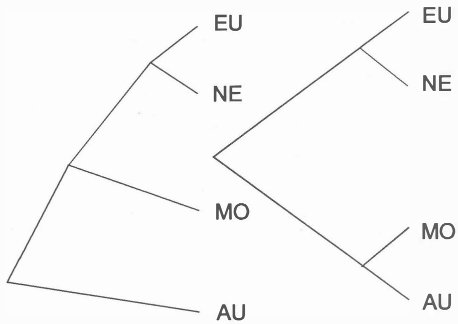

Fig. 7 - Dendrograms of Thoma (left and Mayr (right), obtained for «major races» by using dermatoglyphics and HLA groups respectively.

2.4 Multivariate analysis

Multivariate analysis aimed at showing how the inadequate use of an otherwise useful instrument for data processing can give erratic results.

Of the 130 populations taken from the literature, only 38 had complete data for all 30 characters: they report in particular the absolute frequency, character for character. SJØVOLD's test (as performed by many of the authors quoted here) was applied to these 38, and also a test used by SANGHVI (1953) for dermatoglyphics (called G^2 and mainly based upon χ^2).

SJØVOLD's test was also applied with a slight modification: instead of the absolute frequencies experimentally obtained by researchers for each character, frequencies drawn from the percentages published by the Authors were used, and the total number of crania examined was considered. Moreover, SANGHVI's G^2 was applied in two different ways: first using all 30 variants, and then only six characters chosen at random (6, 9, 16, 18, 22, 24).

With respect to the total of 703 comparisons two by two, which were possible among the 38 populations, the following are significantly different:
- 669 with the original SJØVOLD test;
- 578 with the modified SJØVOLD test;
- 4 with SANGHVI's G^2 using only 6 variants;
- 0 with SANGHVI's G^2 using all 30 variants.

By introducing a vast range of modifications to the multivariate analysis tests and by adopting others as desired, all possibilities from 0 to 703 may easily be obtained. However, in the range of the four possibilities verified with the original SJØVOLD test (evidently very limiting and demanding), the same populations are almost all different, whereas they are all found to be equal with the SANGHVI test applied to 30 variants!

2.5 *Conclusions*

The 30 minor anatomical variables, which have recently been so extensively studied, are not all discontinuous, although some are clearly quantitative. Moreover, the possibility of confusion in defining some of the 30 characters has been admitted: consequently, there is intrasubjective error between different observers and these data are therefore not reproducible.

Although genetic determination, investigated only in the case of certain characters and more prevalently not in man, does exist, it is not always high, and we are not dealing with heredity of the simple type: more genes are usually involved and their expressivity may be variable. Many environmental conditions (diet, weight and other non-genetic factors) may influence the presence or absence of the variables.

Although it has been demonstrated that they can occur on either side (right or left laterality makes no difference in the case of bilateral characters), certain variants are not independent of sex or age. Even some diseased states can influence their appearance. There do not in fact appear to be substantial differences between either metric characters and so-called non-metric characters, or particular advantages in the use of the latter.

The population univariate study presented here demonstrates that these two thirds of the characters of Berry and Berry give a certain geographic discrimination, but only in the case of vast areas like continents.

By comparing the data of different authors, sophisticated multivariate analyses show evaluative differences in the definition of the variants used by different researchers rather than genetic diversity among populations. Thus, much of the biological significance of skeletal data is lost by the time computer analysis results are available.

If we wish to continue using multivariate statistics in the future, greater caution must be taken: use of uniform nomenclature (perhaps Latin) is not sufficient for standardisation of variants. It will be necessary to choose characters that are truly definable in terms of presence-absence; they need not necessarily be the 30 variables discussed here. They should not be correlated with each other (not even at a low level) and the genetic component should be high enough to be well demonstrated. Lastly, whenever the independence of sex and age is found to be certain, comparisons should only be made between homogeneous samples.

3. Quantitative anatomical (or measurable) variables

3.1 *Premise*

Although there are many merely descriptive publications on human skeletal remains belonging to Italian Pre-Protohistory, the same cannot be said for those works which make a real interpretative synthesis of such an amount of numerical data; as a matter of fact critical works on this subject are lacking. Among the latter are an old work by Corrain and Parenti (1973) on the skeletal series of the Italian Neolithic, and the most recent anthropological synthesis of the same Neolithic (Facchini et al. 1984).

We have therefore made a first attempt at pointing out a chronological subdivision in the set of Italian skeletal remains - with the only exclusion of Sardinia, because of its well-known geographic isolation - using for this purpose proper statistical programs. The small number of specimens correctly exploitable (as will be shown hereafter) prevented a further geographical subdivision (otherwise very desirable); although generally, in each chronological sample, Northern Italy is more frequently represented, almost each period shows fair geographical heterogeneity. Although we are fully aware of the criticism that directly derives from this, it is true that Italy does constitute a geographic unity and that nearly all the remains published up to now and correctly comparable have been used.

The low number of samples is due to the two rules that we strictly followed to obtain the maximum degree of accuracy of our results:

1) exploitation of the only data definitely related to single individuals and, *pari passu,* the exclusion of those concerning group averages - even accompanied by parameters of variability - or related to multiple burials with mixed remains: in any case this link is required by the following multivariate analysis;
2) exclusive consideration of skeletal remains whose chronological attribution had been verified by diagnosis of two of the most qualified specialists in this field: B. Bagolini and A. Broglio, respectively from the Universities of Trento and Ferrara.

3.2 Methodology

Some classical skeletal dimensions were used, i.e., the 32 quantitative characters listed below, with the numbers used by Martin and Saller (1957) in their treatise: skull (1, 8, 9, 17 or 20, 45, 48, 51 or 51a, 52, 54, 55, 68, 69, 70, 71); humerus (1, 5, 6, 7); ulna (3, 13, 14); radius (1); femur (1, 2, 6, 7, 9, 10) and tibia (1, 8a, 9a, 10b).

When the basion-bregmatic height was not available (in skulls with no base) it was deduced from the auricolo-bregmatic height by adding 20 mm, as suggested by Olivier (1960). The same was done for orbital width: in the few cases in which only the width obtained on the dacryon was reported, the width at the maxillo-frontal was deduced by adding 3 mm (Piquet, 1954). In the case of symmetrical characteristics (right and left), only one mean value was considered for each individual.

During the processing of bibliographic material, it immediately appeared that remains which could be taken into account were both few, and incomplete and fragmentary. Because of their antiquity and precarious state of preservation, these remains had already appeared only partially measurable to those who had reconstructed and described them.

Besides the above-mentioned limitation of the statistical analysis on exploiting literature data, further restrictions on the number of remains that could be considered were posed by the exclusion of infantile remains, of those for which sex could not be reliably and unequivocably attributed and, lastly, by those with considerable pathological premortal malformations or excessive postmortal deformities. Although a certain margin of uncertainty or personal error is always allowed in age and sex diagnosis and dating, we did not wish to enrich our sample with possibly well preserved but not completely suitable elements for good research.

It should also be noted that the quantity of skeletal material is such that all helpful metrical features can rarely be exploited, since the post-cranial skeleton is often partially or totally missing and the skull itself may be incomplete or missing.

Although correct statistical analysis imposes various methods of sampling, any attempt at strictness in this sense had to be set aside *a priori.* For anthropological remains of the past, any sampling method seems forced (given the characteristics of the material examined) and, if applied, it becomes - as in this specific case - a double-edged weapon: to reduce what little we have is not advantageous.

The chronological arrangement proposed by the specialists consists of a division into seven periods and, within certain limits, considers the scarcity of available material. Those quite traditional periods are:

1) Upper Palaeolithic;
2) Mesolithic;
3) Early Neolithic or Ancient Neolithic (impressed pottery);
4) Middle or Full Neolithic (square mouth vases);
5) Recent or Late Neolithic (Lagozza phase) and Eneolithic (Calcolithic or Copper Age);
6) Bronze Age (included latest Eneolithic and the bellshaped vases);
7) Iron Age.

Sex attribution leads to further impoverishment when males (m) and females (f) are considered separately for each of these time intervals, as correctly done for dimensional variables. Obviously, the skeletons of children (from 0 to 12-13 years, in accordance with VALLOIS' classification) were not taken into account; nevertheless, some sub-adult individuals (13-20 years) were included when their dimensional values clearly showed that they were fully developed subjects.

We selected some series of remains that could be referred to a total of 204 definitely datable skeletons or parts of them, of reliable sex and age (see tab. 7). For their geographic location, see fig. 8.

3.3.1 Univariate analysis of dimensions.

The parameters and statistical indices fixed for the various groups of data were: number of valid observations and number of missing data (i.e., not available in that skeleton for that specific quantitative variable), mean and standard error, median, mode, range, standard deviation, coefficient of variation, skewness and curtosis.

For reasons of space, the many extensive tables regarding univariate analysis of dimensions (skeletal measurements) and forms deriving from them (anthropometric indices) cannot be made here. However, it should be noted that the variability coefficient generally plots around low values (5%) especially as regards skull characters, and only exceeds 10% in one sixth of cases, mainly regarding post-cranial variables: e.g., upper transversal ulnar diameter, upper dorso-volar ulnar diameter, sagittal and transversal (mid-diaphysis) and upper sagittal femoral diameters, and maximum and transversal tibial diameters at the nutritional foramen. Instead, the lengths of the long limb bones generally fall into variability

PERIOD	REGION	SKELETAL SERIES	AUTHOR-DATE
I: Upper Paleolithic	Liguria	1. Balzi Rossi	Graziosi, 1942
(16m, 2f)		2. Arene Candide	Sergi et al., 1974
		2. Arene Candide	Paoli et al., 1980*
	Abruzzo	3. Bacino fucense	Parenti, 1961
		4. Grotta Maritza	Borgognini Tarli, 1969
	Apulia	5. Grotta Paglicci	Mallegni e Parenti, 1972-73
	Sicily	6. S. Teodoro	Graziosi, 1947
II: Mesolithic	Trentino	7. Vatte Zambana	Corrain et al., 1976*
(3m, 1f)	Sicily	8. Grotta Molara	Borgognini Tarli, 1976
		9. Grotta Uzzo	Borgognini Tarli, 1980
III: Early Neolithic	Liguria	2. Arene Candide	Parenti e Messeri, 1962
(7m, 1f)		10. Arma Aquila	
		11. Arma Nasino	Milanesi e Lombardi, 1978
IV: Middle Neolithic	Liguria	2. Arene Candide	Parenti e Messeri, 1962
(18m, 13f)		10. Arma Aquila	
		12. Pollera	
	Alto Adige	13. Appiano	Manfrin Guarnieri, 1953
	Trentino	14. Romazz.,La Vela	Capitanio, 1978*
	Venetia	15. Quinz. Veronese	Corrain, 1960*
	Abruzzo	16. Ripoli	Parenti, 1957
V: Late Neolithic/ Eneolithic	Liguria	17. Cav. Bertrand	Parenti e Messeri, 1962
	Trentino	18. Lisignago	Corrain e Capitanio, 1967*
(44m, 27f)	Venetia	19. Casarole	Corrain, 1964*
	Lombardy	20. Remedello	Corrain, 1962-63*
	Emilia Rom.	21. Spilamb.-S. Ces.	Corrain e Capitanio, 1981*
	Tuscany	22. Agnano-Gr.Leone	Parenti et al., 1960
	Tusc.-Lig.	23. Vecchiano	Formicola, 1980
		24. Buca Tana Magg.	
		25. Fondineto	
		26. Buca Fate Nord	
		27. Grotta Colombi	
		28. Gr. Fate Calom.	
	Latium	29. Ponte S. Pietro	Parenti, 1963
		29. Ponte S. Pietro	Parenti, 1970
		30. La Porcareccia	
		31. Garavicchio	
		32. Chiusa d'Ermini	
	Campania	33. Pontecagnano	Corrain, 1970
	Apulia	34. Laterza	Passarello, 1972-73
		35. Cala Colombo	Pesce Delfino et al., 1977
VI: Bronze	Liguria	36. Matta	Parenti e Messeri, 1962
(30m, 18f)		37. Scoglietto	Parenti, 1962
		38. Galleraie	Parenti, 1954
	Trentino	39. Solteri	Corrain e Capitanio, 1967*
		40. La Vela	Corrain, 1971*
		41. Romagnano	Capitanio, 1973*
	Lomb.Ven.	42. Garda V. Ver	Corrain, 1958*
	Lombardy	43. Roncoferraro	Corrain, 1961
		44. Cavriana	Manfrin, 1956
	Tuscany	45. Belvedere	Corrain, 1957
	Sicily	51. Sicilia Orientale	Passarello e Alciati, 1969
VII: Iron	Trentino	46. Busa Brodeghera	Corrain e Capitanio, 1960
(16m, 8f)	Venetia	47. Este	Marcozzi, 1948
		48. Volargne	Corrain e Ersparmer, 1979
		49. Spina	Marcozzi, 1963*
	Apulia	50. Ischitella	Corrain, 1958
	Sicily	51. Sicilia orientale	Passarello e Alciati, 1969

Table 7 - List of the italian skeletal series (excluding Sardinia) considered in this research (see fig. 8). * Quoted in ALCIATI *et al.*, 1984.

Fig. 8 - Location of pre-protohistoric sites of remains considered in this research (see also tab. 7).

limits similar to those of the skull characters. There is thus a surprisingly low variability in the findings studied, although they are not numerous and are distributed over an enormous geographical area: the homogeneity revealed by the sigma values may reflect a genetic basis.

As regards value distribution, g1 (skewness) analysis indicates mainly asymmetric curves, g2 (kurtosis) definitely leptocurtic (or hypernormal) ones. It should be borne in mind here that the sample studied is a palimpsest representing many more numerous populations.

There are always fewer female series, so that we used only male specimens in this preliminary phase. Classification of skull and facial dimensions was made according to Thoma (1985) (proposed in 1964 by Alexeyev and Debetz). Table 8 shows the categories of male skull dimensions in chronological order.

The average value of maximum skull length decreases with time; this trend is also confirmed by the g1 values, since values below the average are more frequently found in periods V and VI. Maximum skull breadth seems to be relatively constant around medium values, mostly concentrated around the average (g2 always greater than zero); below-average values are more frequent in the periods I-VI, while above-average ones are more frequent in period VII (as indicated by g1). This may be proof of a tendency to breadth increase. The pattern of skull height values tends to fluctuate; giving more importance to the most numerous groups (periods IV-VII) it may be observed that, as mean values decrease, higher-than-average values are more frequent in periods VI and VII.

As concerns facial width, it is clear that average values decrease from the earliest to the more recent periods («gracilization» for German-speaking Authors). However, it must also be noted that while the asymmetry of the measure distribution curve moves to the right in the first periods, it shifts to the left in the last two periods. Thus, the decrease in bizygomatic width is confirmed, since not only do average values fall, but the frequency of lower than average values increases. Upper face height fluctuates over low-medium values.

Orbital breadth, from «wide» (first periods) becomes «narrow» (period IV), but above-average values are more frequent; when values again become «medium» (period V), below-average values become more frequent. Moreover, the g1 values indicate that, on the whole, orbital breadth also varies from «wide» to «medium» in periods VI and VII. Orbital height is quite constant over middle-low values.

Nasal breadth remains between «narrow» and «medium narrow». Where it is «very narrow» (observing median and skewness), higher-than-average values are more frequent. Nasal height seems to be constant on medium-low values, as is also suggested by the g1 values in the various periods.

As regards post-cranial dimensions, it may be noted that quantitative variables more correlated with height (maximum length of long limb bones, especially leg bones) seem to increase from the Upper Palaeolithic to the Iron Age, but this phenomenon is unequivocally supported only by the maximum humerus length. This fact may indicate a modification of physical proportions and not an overall increase in height. After the Upper Palaeolithic, stature always fluctuates around medium-low values, while a real increase took place in the last century because of improvements in hygiene and especially diet.

Martin -Saller	Cranial Measurements	I Period Upper Paleolithic	II Period Mesolithic	III Period Early Neolithic	IV Period Middle Neolithic	V Period Neo-Eneolithic	VI Period Bronze	VII Period Iron
C1	Max. Cranial Length	very long	long	very long	long	medium	medium	medium
C8	Max. Cranial Breadth	medium	broad	medium	narrow	medium	medium	medium
C9	Min. Frontal Breadth	medium	broad	medium	medium	medium	medium	medium
C17	Cranial Height	high	low	medium	high	medium	medium	medium-low
C45	Bizygomatic breadth	broad	very broad	medium	narrow	narrow	narrow	very narrow
C48	Sup. Facial Height	low	medium-low	medium-low	low	medium	low	low
C51	Orbital Breadth	broad	broad	broad	narrow	medium	medium	narrow
C52	Orbital Height	low	low	medium	low	low	low	low
C54	Nasal Breadth	narrow	very narrow	medium	narrow	narrow	medium	very narrow
C55	Nasal Height	low	medium	medium	low	medium	medium	low

Table 8 - Cranial measurements categories after ALEXEYEV and DEBETZ (1964), in the considered periods.

Table 9 - Categories of the most important anthropometrical cranial indexes, after MARTIN and SALLER (and other mentioned Authors) in the different periods.

Martin -Saller	Indexes	I Period	II Period	III Period	IV Period	V Period	VI Period	VII Period
		Upper Paleolithic	Mesolithic	Early Neolithic	Middle Neolithic	Neo-Eneolithic	Bronze	Iron
8:1	Breadth-Length Cr. I. (Garson)	dolicho.	meso.	dolicho.	dolicho.	meso.	meso.	meso.
17(20):1	Height-Length Cr. I.	ortho.	ortho.	ortho.	ortho.	ortho.	ortho.	ortho.
17(20):8	Height-Breadth Cr. I.	acro.	metrio.	metrio.	acro.	metrio.	metrio.	metrio.
9:8	Transvers. Fronto-Parietal I.	metriometop.	metriometop.	eurymetop.	eurymetop.	metriometop.	metriometop.	eurhymetop.
45:8	Bizygomatic-Cr. Breadth I. (Charles)	crypto.	crypto.	crypto.	crypto.	crypto.	crypto.	crypto.
48:45	Upper Face I. (Kollmann)	eurhy.	eurhy.	meso.	meso.	meso.	meso.	lepte.
52:51	Orbital I.	came.	came.	meso.	meso.	meso.	meso.	meso.
54:55	Nasal I.	meso.	lepto.	meso.	meso.	meso.	meso.	meso.
13:14	Platolenic I. (Verneau-Trouette)	euro.	(plato).	euro.	euro.	euro.	euro.	euro.
6:7	Pilastric I. (Olivier)	mid. devel.	mid. devel.	mid. devel.	mid. devel.	mid. devel.	mid.- strong devel.	weak. devel.
10:9	Platymeric I. (Olivier)	platy.	platy.	platy.	platy.	platy.	platy.	platy.
9a:8a	Cnemic (Manouvrier-Verneau)	platy.	platy.	meso.	meso.	meso.	meso.	eurhy.

3.3.2 Univariate analysis of forms.

The statistical parameters used here are those adopted for cranial and post-cranial dimensions. As it was noted that the addition of the female values had very little effect on the anthropometric indices - generally far less than on index unit - it seemed reasonable to combine both male and female values, partly to increase numbers.

For the indices, as for dimensions, it was seen preliminarly that the variability coefficient mainly plotted around 5%, only exceeding 10% in one fifth of cases, and that the g2 values showed leptocurtic curves. It should be noted here that, as for the metric variables of the preceding section, distribution did not generally show normality characteristics. If it is considered that the value distribution of an index may not be normal even when it is calculated starting from two variables both following gaussian modes, the phenomenon may also occur when the initial variables do not show normality characteristics.

Table 9 shows the characteristics which the most commonly used anthropometric indices generally take over time in prehistoric epochs. In terms of form, the phenomenon of progressive skull rounding, well known on a world scale, is confirmed for Italy too. Other similar tendencies are increasing leptene forms of the (upper) face, and the reduced cameconchia characterizing older epochs. With the exception of the cnemic index, which varies in time to reveal transversal flattening of the upper third of the tibial diaphysis, while post-cranial indices do no clearly reveal particular trends.

If the tendencies which have emerged so far are maintained in the future, we may imagine Italians with skulls and orbits becoming rounder and rounder, increasingly small and narrow faces, and more and more slender leg bones. Apart from these extrapolations of the future, the considerations above, based on the univariate analysis, contribute to a better knowledge of our origins: it must be stressed that these could not be illustrated by a multivariate statistical study only; this was all the same carried out and its conclusions have been reported here.

v. 1	- Max Cranial Length	v. 12	- Upper Transversal Ulnar Diameter
v. 2	- Max Cranial Breadth	v. 13	- Upper Dorso-Volar Ulnar Diameter
v. 3	- Min. Frontal Breadth	v. 14	- Radius Max. Length
v. 4	- Cranial Height	v. 15	- Femur Max. Length
v. 5	- Bizygomatic Breadth	v. 16	- Sagittal Mid-Diaphysis Femoral Diameter
v. 6	- Sup. Facial Height	v. 17	- Transversal Mid-Diaphysis Femoral Diameter
v. 7	- Orbital Breadth	v. 18	- Upper Transversal Femoral Diaphysis Diameter
v. 8	- Orbital Height	v. 19	- Upper Sagittal Femoral Diaphysis Diameter
v. 9	- Nasal Breadth	v. 20	- Tibial Length
v. 10	- Nasal Height	v. 21	- Max. Tibial Diameter (at nutritional foramen)
v. 11	- Humerus Max. Length	v. 22	- Transversal Tibial Diameter (at nutritional foramen)

Tab. 10 (a) - List of variables considered in the correlations.

Tab. 10 (b) - Correlation matrix of the variables reported in table 10 (a).

	v.1	v.2	v.3	v.4	v.5	v.6	v.7	v.8	v.9	v.10	v.11	v.12	v.13	v.14	v.15	v.16	v.17	v.18	v.19	v.20	v.21
v.1																					
v.2	0,27	1,00																			
v.3	0,43	0,40	1,00																		
v.4	0,67	0,37	0,19	1,00																	
v.5	0,64	0,42	0,52	0,51	1,00																
v.6	0,37	0,28	0,47	0,40	0,73	1,00															
v.7	0,60	0,23	0,73	0,35	0,66	0,42	1,00														
v.8	0,27	0,28	0,37	0,41	0,21	0,51	0,34	1,00													
v.9	0,26	0,41	0,10	0,25	-0,09	0,22	0,02	0,19	1,00												
v.10	0,34	0,43	0,43	0,30	0,52	0,66	0,37	0,49	0,11	1,00											
v.11	0,39	0,19	0,09	0,57	0,47	0,63	0,09	0,57	0,01	0,63	1,00										
v.12	0,47	0,21	0,41	0,39	0,55	0,37	0,41	0,29	0,20	0,48	0,50	1,00									
v.13	0,45	0,31	0,39	0,42	0,78	0,43	0,53	0,23	-0,10	0,28	0,30	0,66	1,00								
v.14	0,39	0,23	0,12	0,65	0,61	0,67	0,23	0,50	0,01	0,65	0,91	0,58	0,51	1,00							
v.15	0,27	0,31	-0,02	0,62	0,40	0,48	0,03	0,52	0,18	0,51	0,89	0,53	0,37	0,89	1,00						
v.16	0,69	0,34	0,34	0,78	0,76	0,56	0,44	0,34	-0,03	0,46	0,70	0,47	0,61	0,71	0,59	1,00					
v.17	0,66	0,46	0,23	0,67	0,78	0,48	0,48	0,24	-0,04	0,46	0,61	0,53	0,63	0,73	0,57	0,78	1,00				
v.18	0,59	0,26	0,38	0,64	0,71	0,59	0,49	0,39	-0,04	0,51	0,68	0,57	0,57	0,74	0,52	0,84	0,83	1,00			
v.19	0,75	0,48	0,44	0,73	0,72	0,53	0,49	0,50	0,16	0,62	0,78	0,70	0,60	0,76	0,71	0,86	0,83	0,78	1,00		
v.20	0,31	0,36	0,18	0,60	0,54	0,63	0,26	0,60	0,06	0,59	0,85	0,48	0,45	0,91	0,92	0,59	0,65	0,58	0,72	1,00	
v.21	0,49	0,54	0,39	0,53	0,61	0,39	0,56	0,31	0,19	0,68	0,48	0,48	0,54	0,60	0,45	0,68	0,72	0,72	0,71	0,52	1,00
v.22	0,57	0,39	0,34	0,71	0,55	0,41	0,32	0,45	0,35	0,57	0,70	0,72	0,61	0,76	0,72	0,77	0,65	0,77	0,82	0,64	0,76

3.4 Multivariate analysis.

The simplest of multivariate analyses is of course correlation between variables, two by two. Table 10 shows a correlation matrix of 22 of the characters considered here over the entire sample range of 204 skeletons.

The highest correlation (0.75-0.99) clearly deals with the length of the limb bones and thus of their transversal diameters. Correlations between skull and face dimensions and some long bone diameters follow, in order of importance.

High correlations (0.50-0.74) confirm the relationship between skull and face dimensions and between cranial and post-cranial skeleton dimensions.

Some negative correlations also appear, mainly between nose breadth and other dimensions of the face or femur, the latter clearly random and in any case around zero.

The sample was also subjected to discriminant analysis, within which the problem of replacing missing data with standard-type data - exclusively to make the groups comparable in numbers - was faced by using the average values of the original series as replacement data.

Basically, two indications emerged from our analysis:

1) the variables mainly discriminating the studied groups are, for the first discriminant function (40.6% of variance is explained), in decreasing order: femoral maximum length, tibial length, tibial transverse diameter at the nutritional foramen, upper ulnar transverse diameter, transverse femoral mid-diaphysis diameter (at the middle). This also agrees with, and even exceeds, some conclusions of Facchini (1984): «...it may be noticed that the post-cranial skeleton assumes a distinguishing power almost equal to that of the skull»;
2) the relation between the reclassification of the cases calculated on the basis of discriminant functions and the original classifications is 78.2%: this fact confirms not only the existence of a fairly good separation of groups, but also the effectiveness of the metrical variables used in the discrimination.

3.5 Conclusions

We are aware of the limitations of attempts at a typological scheme, particularly of small samples like ours of the Italian population over thousands of years. The demonstrative methods on morphological bases used by Palaeoanthropologists cannot be considered conclusive, even if the small number of finds is left out of consideration. We must also remember that human types are not immutably static but change with time, because they are dynamic processes in constant evolution. The greatest care must be used when trying to establish relations between pre-protohistoric «types» and present human races on the grounds of combinations of morphological characteristics regarded as typical.

It is for all these reasons, as well as for others of a political and sociological nature, that anthropological typologies during the history of this branch of learning are still alternately pursued hopefully or heatedly debated. For example, after the Second World War Poland saw «morphologists» against «anthropostatisticians», both then superceded by «populationists».

In this regard, the recent speech of one of the populationists, an undisputed authority in the field of human evolution (Harrison, 1982), is enlightening:

«Whereas the general achievements in human population genetics have been profound, the specific achievements have, I think, been disappointing... The drift-versus-selection controversy goes endlessly on with little definitive evidence either way... And most disappointing to us as anthropologists is the fact that knowledge of the relationships between human populations is as tentative as ever, with few further insights than those gleaned by the old anthropometrists and craniometrists...».

Going back to our human remains, and in view of the almost unanimous agreement of researchers who have recently studied Italian paleoanthropology (Bianchi *et al.,* 1980; Alciati *et al.,* 1984; Facchini *et al.,* 1984), it may be presumed that, in Italy too, the two main typologies, Cro-Magnon and Combe Capelle, are recognizable in the case of the first two periods considered. It may thus be stated that Mesolithic man, after Upper Palaeolithic man, evolved towards Present man: due to his antiquity, his morphology differs more or less from the former, and regional variations appear to reveal present ones more or less clearly.

As regards Neolithic and Bronze Age anthropology in the European, Mediterranean and Asia Minor areas, partial substitution of Mesolithic man by «already gracilized immigrants» may generally be noted. The study of cultivated plants and domestic animals proves that these immigrants came from the Eastern Mediterranean and the Balkans. The population seems to evolve gradually towards brachycranialization, vault elevation, nose raising, increase of the two main facial diameters without any particular modification of the upper facial index, moderate increase in the orbital height» (Riquet, p. 264). This appears more true for the Italian Adriatic populations, which show more traces of the Danubian variety of the Mediterranean race (ovoid skulls, tendentially smaller skeletal dimensions) than other groups which are more similar to Western or Afro-Mediterranean varieties (ellipsoid skulls, larger skeletons), as stated by Facchini and Colleagues (1984).

In any case, this is a case of *in loco* evolution of a prevailing proto-Mediterranean form, as Cappieri stated (1977, 1978). This author supported the physical homogeneity of peninsular peoples and opposed large-scale population movements, too often assumed on uncertain bases, but unexplainable in other ways by microevolutive phenomena, as now clearly verified on a continental level.

Catastrophic mass movements (and thus of genes, although not of cultural elements, which are much faster) have probably been the exception rather than the rule in past ages. This was because human groups were small and quite scattered; movement was difficult in rough highlands covered with forest, so numerous in the Italian peninsula, and climatic, hunting, fishing and harvesting conditions were so good that the aborigines were induced to settle.

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