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Światowit 33, 175-197

1972

ŚWIATOWIT
Warszawa 1972 t. XXXIII

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INTER- AND INTRAPOPULATIONAL RACIAL DIFFERENTIATION OF TLATILCO, CERRO DE LAS MESAS, TEOTIHUACAN, MONTE ALBAN AND YUCATAN MAYA

SOME GENERAL CONSIDERATIONS

The actual state of physical anthropology in the field of taxonomy is characterised by clear evidences of disintigration and decay. This is due to theoretical speculations of the adherents of so called "new anthropology" or human biology who oftenly are not anthropologists by profession but physicians, physiologists, geneticists, serologists, statisticians etc. Their activities tend to obscure the regularities which appear already after observation of simple morphological facts. From a stress laid upon weakly documented parallelistic conceptions in the theory of hominid evolution, has grown up a deep forest of phylogenetical trees reaching lastly pure polyphyletic branching.

But even more disastrous effects are easily visible in the field of intraspecific taxonomy of recent man where govern simplified and disputable models of population genetics or a return to cartographying single, pheno-or genotypical characteristics, labelled now the clinal analysis. It ought to be emphasized that both these approaches to human taxonomy contradict each other (see: Brace, 1964) since clines may intersect human populations and they do not covary with their boundaries. On the other hand, the populationistic concept of race practically makes equal the notion of the ethnic group with panmictic population and, so, with the notion of a race (see, for example: A. Montagu, 1950). This concept could arise from a forgetting of the real differences between, more or less, well isolated and panmictic animal populations, living under strong and frequently homogeneizing action of the natural selection — and the human populations. The latter, quite to the contrary, are never truly panmictic owing to various social factors, as well as, they are to a different degree isolated from the direct influences of the natural selection because of the cultural activities. Also, their boundaries are permanently changing in time and space, as well as, they are subjected to very strong intergroup hybridisation

process. The populationistic concept of human races has been founded on a belief in the aprioristic thesis that the racial traits are determined by a greater number of randomly combining genes. Consequently, the XIXth century vision of "a blood mixing" in inbreeding populations was replaced by not very different vision of "a cloud of independently sorting genetic particles". In both cases, the notion of race has been directly related to the units of ethno-linguistic division because "a liquid theory" was only changed into "gaseous" state!

However, it should be most firmly stressed that all these critical remarks neither concern the results of concrete investigations of first scientific importance (like, for example: HA Project of IBP) on genetics of human populations and adaptation & adaptability mechanisms nor — a necessity of classifying of really though relatively existing human populations. The remarks deal only with some theoretical misintrepretations of the results and misuse of terms.

In fact, a rasogenetic action of natural selection operates directly on individual phenotypical fractions derived from various human populations promoting rising or splitting different polygenic blocks in which genetic information is not randomly sorted. Therefore, the present author prefers to deal with individual taxonomy of man based on non-random segreggation of coadapted systems of genes which determine a politypic composition of any social grouping of the human species. In this sense, human populations are not races but they consist of a number of primary racial elements and intermediate racial types. This concept of individual racial types, distinguished regardless their populational descent, characterises the Polish Anthropological School. It is based on a simple general assumption that the same taxonomic procedure of multivariate analysis which uses a given concept of geometric distance, may be applied to both levels of intraspecific variability — individual and populational. However, it is very important not to apply, in a mixed sense, the units of populational taxonomy which are average populational types (described by statistical measures of concentration and dispersion) with those of the individual ones. Merely, in a few cases, when some concrete populations are very homogeneous racially, such rough correspondance of individual types to the populational ones may appear. Since, the material of human individuals is more primary than group characteristics of the populations, the relative frequencies of individual types may serve for a description of populational content while the reverse cases are almost impossible. At any rate, methodologically speaking, all methods of populationism, clinal analysis and individual taxonomy may be useful in following rasogenesis and mutual relationships between human groups but, if possible, they should be jointly applied and carefully intrepreted. It must be added yet, that the individual racial type is considered in this paper as a formal category i. e. as a set of

half-intervals of simultaneously treated metric and descriptive traits which denote a relative phenotypical similarity of human individuals, proportional to their relative genetic proximity.

Unfortunately, the activities of "new anthropologists" go so far that they reach the very important question of a proper selection of diagnostic traits for taxonomic purposes. In result, highly heritable and only very slightly ecosensitive polygenic cephalometric and cephaloscopic characters, relatively resistant on both negative selection and genetic drift, have been replaced by simply inherited serological or other traits which do not perform these conditions (with exception of high heritability), necessary for a following the genealogical relationships between human populations. Also, various actual publications of the osseous materials deal oftenly more with pathological and odonthological variations or, with collecting the indirect demographic data than, with good description of the diagnostic taxonomic traits. Perhaps, all these and other factor determined the fact that, up to this time, different series of Prehispanic crania from Mexico have not been uniformely described from the taxonomic point of view. A few notable exceptions represent the papers of J. Comas (1945), J. Romero (1951) or J. Faulhaber (1965) which comprise common metric description of the series from Cerro de las Mesas, Monte Negro and Tlatilco though with omitting various diagnostic cranioscopic variations.

Therefore, the present author has undertaken a new examination of all the available in Mexico series of Prehispanic skulls which would include both metric and cranioscopic traits, established by use of the standardised techniques. Then, their multivariate analysis has been conducted, both from the populational and individual points of view.

MATERIAL AND METHODS APPLIED

The purpose of this paper is to synthetise briefly the results of morphotypological analysis of 6 series of crania from Prehispanic Mexico. They were investigated by the present author during his stay in 1966 at the Department of Physical Anthropology of INAH in Mexico and, partly — in the Museum in Merida. The craniological description directed towards a study of affinity, has included 11 classic linear diameters measured according to R. Martin's technique (g-op, eu-eu, b-ba, ft-ft, zy-zy, zm-zm, n-pr, n-ns, nasal breadth, mf-ek and orbital height), 8 classic indices (cephalic, height-length, height-breadth, fronto-parietal, upper facial of Kollmann, upper facial of Virchow, nasal and orbital) and 29 cranioscopic traits established by use of special photographic scales of Michalski which assure a high degree of intersubjective appreciation. There were taken into account only subadult to adult crania of both sexes in different state of preservation.

Unfortunately, not all the crania have been well archeologically dated according to information provided by their catalogue cards but, this fact does not invalidate much this study since it may be an advantage to verify some working hypotheses when a more detailed dating will come.

Thus, there were analysed here the following series of crania:

1. Zacatenco and El Arborillo (n=6) which may descend from the early phase of the Preclassic period;

2. Tlatilco (n=76) which embraces the whole Preclassic period and was penetrated in its middle phase by archeologically evidenced strong influences of the Olmec (La Venta) civilisation;

3. Cerro de las Mesas (n=19) from the midst of the Olmec territory but dated to the Late Classic period;

4. Monte Alban (inclusive Monte Negro from the Monte Alban I totals n=41) which mainly consists of crania descending from the Classic period but Pre- or Postclassicexamples may also occur;

5. Teotihuacan (n=13), a pooled series which probably refers mainly to the Classic period;

6. Maya pooled series (n=38) from Yucatan which includes crania from Jaina, Chichen Itza, Chincultic, Quintana Roo and Merida dating from the Classic and Postclassic periods.

The present morphotypological study of these crania consisted of the following stages:

a) single trait analysis of the frequency distributions of 10 cranioscopic facial traits which discriminate well between the affinities of 3 Great Racial Varieties of man (Yellow, White and Black) estimated by means of Chi-square test and then, supplemented by the analysis of $\overline{P}$-position index of A. Wierciński (1968);

b) multivariate distance analysis of the average populational types expressed in 10 mentioned above traits, by use of diagraphic method of Czekanowski based on $(DD)^2$ distances of T. Henzel;

c) analogical diagraphic multivariate analysis of the racial compositions of all the 6 examined series calculated by use of the halving method of Michalski on the basis of individual racial types diagnosed according to the procedure of the Comparative-Morphological Trend of the Polish Anthropological School (PSA).

The results of individual typing of crania have been compared with those obtained by the author during his investigations on the human representations of the Olmec and Maya-Toltec art carried out in May 1966, in Jalapa, La Venta, Merida and Chichen Itza.

SUMMARY OF SINGLE TRAIT ANALYSIS

The percentage distribution of all the 5 more voluminous series of crania (i.e. with exception of the series No 1) have been compared in reference to the 10 cranioscopic traits, selected out of a total set of 29 features. There were considered only undoubtedly diagnostic traits in comparisons between great racial varieties of man, ie.: prominence of maxilla (degree of prognathism), height of nasal root, prominence of nose, prominence of nasal spine, position of nasal spine, profile of nase, frontal shape of nasal bones, shape of orbits, depth of maxillary incisure and, depth of canine fossa. Before this, the numbers Michalski's scales were converted into precentage scales of A. Wierciński (1968) which attempt to express alternatively a distance between extreme individual variants of the Yellow (0%) and White racial varieties (100%). In this way, a possibility of calculating the approximative arithmetic means was assured. The average populational types of the series represents table 1. The Chi-square estimations of differences in particular traits has been presented at the 10th Congress of Tchecoslovakian Anthropologists (A. Wierciński, 1969) and they will be published soon. Here must suffice a multivariate comparison conceived in the form of the diagram of Czekanowski (fig. 1) based

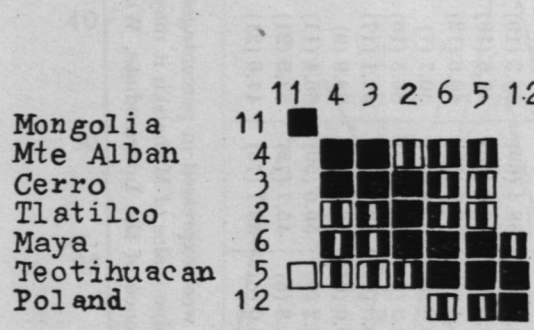

Fig. 1. Diagram of succesive differences based on number of significant χ^2 (upper limit of similarity = 3)

on the number of significant differences at the P-level less than 0.05. It appeared that more than 3 significant differences should denote dissimilarity between the pairs of compared series. For some cases, it was impossible to obtain in particular classes of frequency distributions more than 5 items and, so, verbal hypotheses of significance were advanced on the basis of the shapes of distributions and differences between the means. This regards mainly the Teotihuacan series. In any case, the received diagram divided according to the dendrite method, revealed interesting regularities. First of all, the Mongolian series, treated here as a variability model of the Yellow variety, occupied completely isolated position. The Mexican series created their own grouping

Table 1

Average characteristics of 10 facial cranioscopic traits converted into percentage scales

Trait/Series No	Zacatenco* El Arbo-rillo	Tlatilco	Cerro de las Mesas	Monte Alban	Teotihua-can	Yucatan Maya	Mongolia	Poland
	1	2	3	4	5	6	11	12
Prominence of maxilla	54.2 (6)	38.4 (69)	35.3 (19)	46.1 (38)	42.3 (13)	44.9 (38)	38.4 (64)	54.4 (110)
Height of nasal root	43.8 (6)	47.8 (65)	49.6 (19)	55.2 (38)	53.3 (10)	58.2 (38)	35.4 (63)	66.3 (111)
Prominence of nose	61.1 (6)	40.5 (50)	40.6 (12)	56.9 (31)	63.9 (9)	57.4 (37)	31. 1(59)	73.9 (83)
Profile of nose	70.8 (5)	33.6 (37)	30.7 (7)	54.5 (24)	56.5 (9)	40.8 (30)	31.8 (59)	70.2 (74)
Position of nasal spine	22.2 (6)	53.7 (57)	66.5 (16)	63.9 (36)	55.2 (11)	61.6 (36)	42.0 (63)	58.0 (95)
Prominence of nasal spine	70.0 (6)	52.7 (58)	52.1 (17)	53.8 (38)	57.5 (11)	61.0 (36)	44.6 (63)	62.5 (95)
Shape of orbits (frontal)	100.0 (6)	88.4 (51)	88.9 (9)	80.4 (37)	60.0 (10)	83.1 (37)	41.3 (63)	76.3 (113)
Frontal shape of nasal b.	50.2 (6)	56.6 (50)	56.4 (11)	62.6 (35)	71.0 (10)	64.3 (35)	32.1 (62)	68.8 (93)
Depth of maxillary incisure	34.8 (6)	45.7 (73)	53.0 (21)	64.3 (41)	45.8 (12)	53.2 (39)	36.8 (63)	59.8 (111)
Depth of canine fossa	50.0 (6)	39.1 (76)	47.6 (21)	46.1 (38)	33.3 (12)	40.2 (38)	34.1 (63)	57.3 (116)

Remarks: all the cranioscopic traits were expressed in percentages of the Yellow (0%) to White (100%) scale transformed by Wierciński (1968) according to photographic scales of Michalski; it may be noticed that the Polish series is not the best example of the White variety owing to strong influence of the Intermediate, White-Yellow Laponoid race.

with some places of concentration being strongly connected with the series from Poland, which was taken into account as a second frame of reference, i.e. as the variability model of the White variety. It denotes that the ancient Mexican series are more shifted towards White variety pattern of facial traits than, to the classic Mongoloids. Also, it is worthy of mention that a lack of significant differences joins Maya with Teotihuacan and Monte Alban with Cerro de las Mesas while Tlatilco with Cerro and Maya series as an intermediate link. Thus, it might be said that ancient Mexico was inhabitated by a chain of interrelated populations which can not be regarded as typical Mongoloids. The latter conclusion could be inferred not only owing to a more "White" outlook of the nasal region but also that of the maxilla.

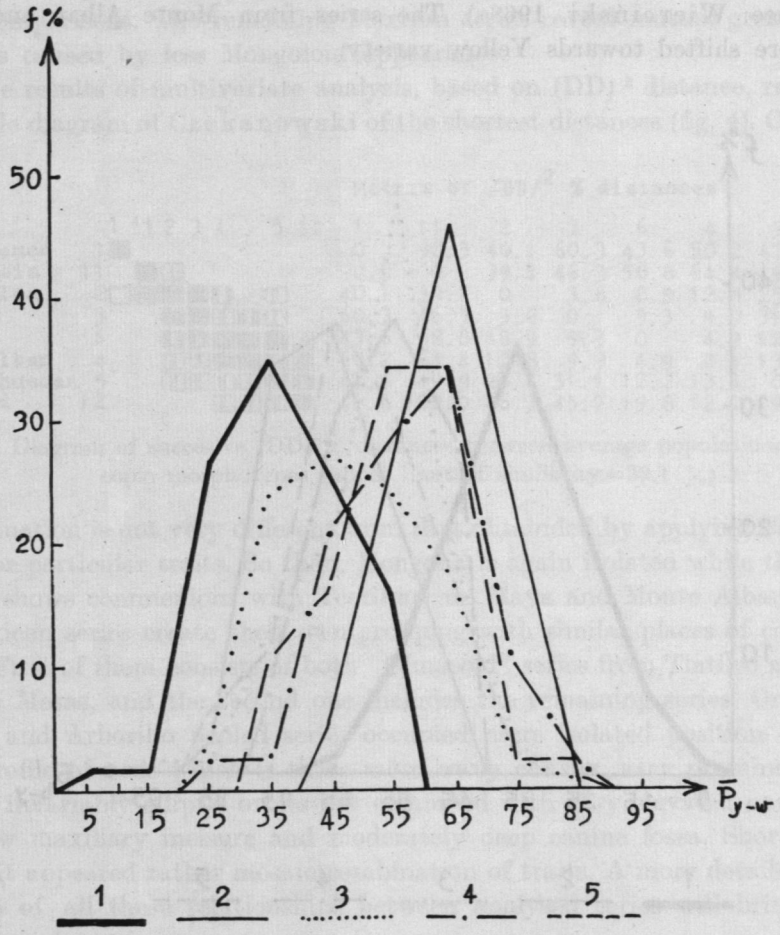

Fig. 2. Frequency curves of Mean Index of Position ($\bar{P}_{y-w}$) between Yellow and White Varieties. 1 — Mongolia, 2— Poland, 3 — „Olmecoids", 4 — Mte Alban, 5 — Maya-Yucatan

Now, it would be worthwhile to consider the positions of particular Mexican series between two racial varieties (Yellow to White and, Yellow to Black) as measured by the Mean Index of Position $\overline{P}$ of Wierciński which reflects averaged alternative distance in reference to the mentioned above 10 facial traits. The $\overline{P}$ value which equals to 0% or 100% denotes extreme individual variant while the value of 50% corresponds to an intermediate position or a lack of discrimination. A graphic review of frequency distributions of both $\overline{P}$ indices is represented in the figs. 2 and 3. It may be easily seen that all our Mexican series are, more or less, heterogeneous and located rather between the compared racial varieties. Especially, the „Olmecoid" curve consisting of the Tlatilco and Cerro de las Mesas, penetrates clearly both White and Black varieties. This was evidenced by significant surpluses of their extreme values of $\overline{P}$ (see: Wierciński, 1968a). The series from Monte Alban and Maya are more shifted towards Yellow variety.

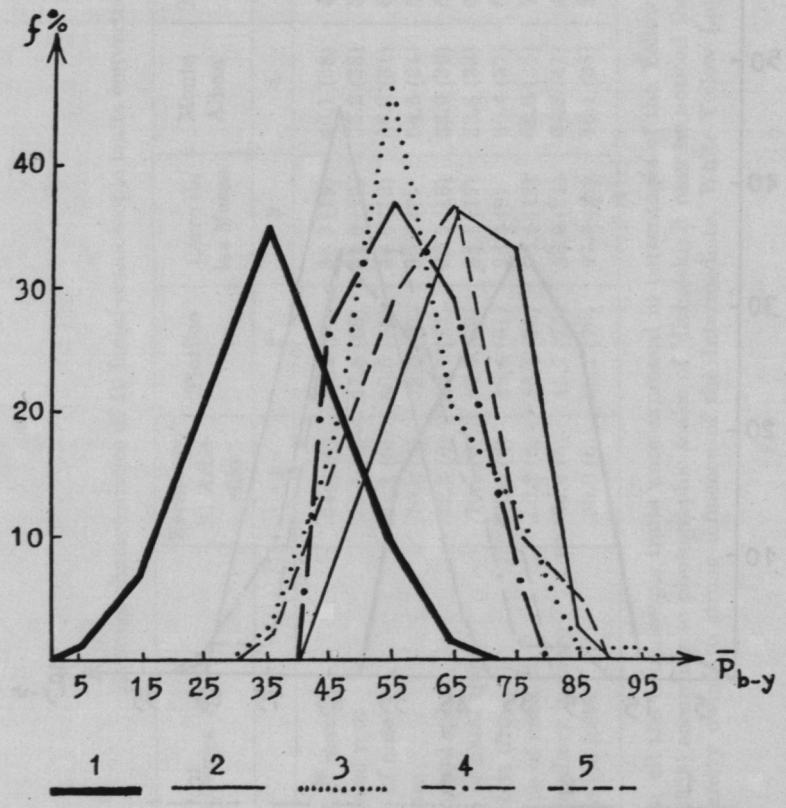

Fig. 3. Frequency curves of Mean Index of Position ($\overline{P}_{b-y}$) between Black and Yellow Varieties. 1 — Uganda, 2 — Mongolia, 3 — „Olmecoids", 4 — Mte Alban, 5 — Maya-Yucatan

MULTIVARIATE ANALYSIS OF AVERAGE POPULATIONAL TYPES

The basic data for a multivariate analysis yields table 2 where arithmetic means of the cranioscopic facial traits were presented as viewed in the Yellow White comparison. Thus, at the moment only face is being considered to avoid distortions introduced by artificial deformation. It may be seen, at first glance, that the means of 10 craniscopic traits reveal undoubted diagnostic weight, ranging from typical Mongoloid to typical White appearance. In general, both "Olmecoid" series from Tlatilco and Cerro de las Mesas are distinguished by their relatively most prognathous face, most flattened nose with concave profile, less prominent nasal spine which expresses clearly the average values of both $\overline{P}$ indices. The latter show the lowest figures in these two comparisons. The remaining Mexican series reveal mutual greater similarities caused by less Mongoloid appearance.

The results of multivariate analysis, based on $(DD)^2$ distance, represents suitable diagram of Czekanowski of the shortest distances (fig. 4). Of course,

Matrix of $/DD/^2$ % distances

	1	11	2	3	6	4	5	12
Zacatenco 1	0	90.5	40.1	60.3	43.6	50.2	47.8	41.6
Mongolia 11	90.5	0	39.1	46.3	58.8	64.4	49.9	100.0
Tlatilco 2	40.1	39.1	0	3.6	8.9	12.8	25.4	46.3
Cerro 3	60.3	46.3	3.6	0	9.3	9.9	31.1	45.7
Maya 6	43.6	58.8	8.9	9.3	0	4.9	12.2	19.8
Mte Alban 4	50.2	64.4	12.8	9.9	4.9	0	13.4	12.0
Teotihuacan 5	47.8	49.9	25.4	31.1	12.2	13.4	0	19.4
Poland 12	41.6	100.0	46.3	45.7	19.8	12.0	19.4	0

Fig. 4. Diagram of succesive $(DD)^2$% distances between average populational cranioscopic morphotypes (upper limit of similarity = 39,1 %)

the situation is not very different from that obtainded by applying Chi-square test for particular traits. So then, Mongolia is again isolated while the Polish series shows connnexions with Teotihuacan, Maya and Monte Alban. All the 5 Mexican series create their own grouping with similar places of concentration. First of them consists of both "Olmecoid" series from Tlatilco and Cerro de las Mesas, and the second one includes the remaining series. Only Zacatenco and Arborillo pooled series occupied more isolated position owing to the profile of nose which is there more wavy convex, very prominent nasal spine, invariably elliptic orbits but combined with very elevated nasal spine, shallow maxillary incisure and moderately deep canine fossa. Shortly speaking, it appeared rather mosaic combination of traits. A more detailed explanation of all these relationships between analysed series will bring individual racial taxonomy.

Now, worthy of considering may appear the average populational types of the series based on means of the classic craniological indices. The means were

calculated separately for both, unde formed or only slightly deformed crania and the deformed ones. The sexual dimporphism is omitted here since it is rather slight in these traits. The arithmetic means represented in table 2 revealed interesting regularities, in spite of small or very small volumes of particular series and, only rough, visual establishing of a degree of artificial deformation (most oftenly, tabular erecta with exception of a short Monte Negro series where oblique type has been observed). The cephalic index shows most regular differences which range only from -9 to -13, They seem to depend on the category of index of the undeformed crania. The difference is greatest for dolichoid forms and smallest for the brachycephals. Unfortunately, number of itens for both altitudinal indices are really too small to have any more representative comparison. However, if only more numerous series of Monte Alban, Maya and Tlatilco would be considered, some regularities may be easily seen. Thus, differences in the height-length index show always negative values ranging from -3 to -7 while, in the heightbreadth index they are always positive and range from $+5$ to $+9$. The facial indices reveal merely slight tendencies towards lower face and higher orbits in deformed crania.

Therefore, the influence of deformation on the facial traits may be neglected in taxonomic procedure while that on the cephalic index could be rather accurately overcalculated. The altitudinal indices should be simply omitted in the analysis since they have only limited diagnostic weight.

These observations allowed to express average populational types (called further: a. p.-types) of the particular series of crania in a more pooled way. So then, the table 3 comprises means of cephalic index calculated for undeformed or only slightly deformed crania while those of the facial indices refer to all the crania of both sexes. At the same time, total constellation of the 10 studied before cranioscopic facial traits have been synthetically conceived in the from of $\overline{P}$-position indices between Black to Yellow varieties and Yellow to White ones.

At present, it will be more easy to appreciate the interpopulational variability of a.p.-types of the series.

First of all, almost a lack of any interpopulational differentiation ought to be emphasized for all the 3 facial indices. The face is monotonously medium high (being relatively the lowest in Monte Alban), nose moderately broad and orbits high. Far more variable are both $\overline{P}$ indices and cephalic index. The first synthetic characteristics of the total outlook of face reveal for both "Olmecoid" series and Monte Alban rather low figures in the comparison Black-Yellow varieties while in the combination Yellow-White, Monte Alban series already is shifted more to the White variety as the remaining series with exception of the "Olmecoids". Thus, a special position of Tlatilco and Cerro de las Mesas should be stressed which allows to assume some real admixtures

Table 2

Comparison of the average characteristics of undeformed and deformed crania

Trait/series	Zacatenco+ El Arborillo		Tlatilco		Cerro de las Mesas		Monte Alban		Teotihuacan		Yucatan Maya	
	undef.	def.	undef.	def.	undef.	def.	undef.	def.	undef.	def.	undef.	def.
Cephalic index	86.0 (2)	96.1 (2)	80.1(24)	92.9(44)	82.6(10)	93.7 (8)	83.1(15)	91.9(18)	77.7 (3)	90.6 (8)	89.6(15)	99.8(22)
Height-length ,,	83.9 (2)	82.4 (2)	80.0(14)	86.5(26)	74.6(4)	82.4 (2)	79.0(9)	81.7(11)	—	—	76.1(14)	79.1(17)
Height-breadth ,,	97.6 (2)	85.5 (2)	99.7(15)	91.2(26)	95.0(4)	87.7 (2)	95.7(9)	87.5(12)	—	—	84.3(14)	79.3(17)
Upper facial K. ,,	52.2 (3)	56.4 (2)	54.9(13)	52.8(30)	54.7(4)	51.1 (5)	51.0(14)	50.2(15)	53.9 (3)	52.6 (8)	51.4(14)	52.4(20)
Upper facial V. ,,	69.2 (4)	74.0 (2)	72.7(17)	71.5(35)	65.0(6)	69.7 (5)	70.4(17)	67.9(17)	71.8 (3)	70.3 (8)	70.4(15)	69.8(21)
Nasal ,,	48.6 (4)	54.1 (2)	48.2(17)	48.6(37)	46.5(5)	47.9 (5)	47.9(17)	49.4(17)	48.4 (3)	48.1 (8)	49.3(15)	48.0(21)
Orbital ,,	86.4 (4)	82.3 (2)	85.2(17)	86.0(45)	83.5(5)	86.4 (5)	83.6(17)	86.7(19)	84.1 (2)	87.7 (8)	84.3(14)	86.6(22)

Table 3

Comparison of the average populational types of particular series (m+f)

Index/Series	Zacatenco+ El Arborillo	Tlatilco	Cerro de las Mesas	Monte Alban	Teotihuacan	Yucatan Maya
Cephalic	86.0	80.1	82.6	83.1	77.7	89.6
Upper facial of Kolm.	53.8	53.4	52.7	50.1	52.9	51.8
Nasal	50.5	48.4	47.2	48.6	48.2	48.7
Orbital	85.0	85.8	85.0	85.1	87.0	85.7
$\bar{P}$-position: Black-Yellow	62.5	53.7	58.5	56.7	65.1	60.8
$\bar{P}$-position: Yellow-White	57.7	48.6	50.8	57.9	52.8	56.1

Remarks: the means of cephalic index are based on undeformed or only slightly deformed crania while the remaining indices include both kinds of the crania; as it may be seen from the values of $\bar{P}$ index between Black (0%) to Yellow (100%) some series are shifted more towards Black variety but never below 50% while, $\bar{P}$ index between Yellow (0%) to White (100%) shows frequently values only slightly above 50%. This is an example of the relativity of comparisons dependent on the given frame of reference.

of the Negroids which may appear also in Monte Alban. The remaining series are distinguished by more Yellow variety outlook shifted toward the White variety.

The distribution of mean values of the cephalic index shows two extremes and is strictly proportional to the means of deformed cracia (see again table 2). On one hand are means of the Teotihuacan and Tlatilco which express mesocephaly, on the other hand are very brachycephalic Maya from Yucatan and Zacatenco+El Arborillo. The Cerro and Monte Alban yield intermediate position, in the category of moderate brachycephaly. Thus, the means of the cephalic index have added only one new taxonomic information in regard to that obtained by analysis of 10 cranioscopic traits. Namely, Teotihuacan is related to Tlatilco while Yucatan Mayas appear as an extreme more similar to Monte Alban and Zacatenco+El Arborillo series.

Now, it might be of a greater interest to compare craniological series with a.p.-types of the living Amerindians from Mexico studied by the present author also by use of the diagraphic multivariate analysis (see: A. Wierciński, 1970). This is possible thankfully to the 12-fold division of craniometric indices related to the analogical division made by Michalski for the living material.

A comparative analysis may start with a.p.-type of the Tlatilco series (see: table 4). Fortunately, the stature (calculated according to the formulas of S. Genoves, 1967) could enlarge the number of traits for the osseous material. The presented comparison shows that Tlatilco is practically indistinguishable from the a.p.type of group III of the diagram constructed for the living. The latter group has been called: the Hybrid Nahuan type and it consists of various Mestizo groups from Jalapa and Vera Cruz. Does it mean that these living populations may be viewed as a simple continuation of the "Olmecoids" or, that their similarity arose from an independent, convergent hybridisation process which embraced in modern times the same White component and some Negroid influences?

At present, the solution is impossible. In any case, a probability of highly heterogeneous status of "Olmecoids" from Tlatilco has been markedly increased.

A more dolichocephalic Teotihuacan series occupied somewhat different position (see: table 5). With exception of a little narrower nose, it corresponds well to the Oomi-Mayan (sic!) type on the living. The latter type includes Mam, Tzotziles and Tzeltales which are strongly related to the next in the diagram — the Otomi-Mazahuan type. At the same time, a great similarity of Teotihuacan a.p.-type to typical Nahuas from Morelos (belonging to the Proto-Nahuan type) must be emphasized. Thus, the studied series from Teotihuacan may be viewed as basically Otomi-Mayan type which has been influenced by a strong Proto-Nahuan population.

Table 4

Comparison for Tlatilco

Trait/a.p.-type	Tlatilco	Hybrid Nahuan
Stature (m)	162.3	162.6
Cephalic ind.	81.1	80.0
Face ,,	89.4	88.2
Nose ,,	70.4	73.6

Table 5

Comparison for Teotihuacan

Trait/a.p.-type	Otomi-Mayan	Teotihuacan	Nahuas G. Mariaca
Stature	157.7	—	163.4
Cephalic ind.	79.0	78.7	81.1
Face ,,	88.0	88.9	89.7
Nose ,,	77.0	70.2	69.8

Table 6

Comparison for Monte Alban

Trait/a.p.-type	Monte Alban	Cerro de las Mesas	Maya-Totonacan	Huastecos Tantoyuca	Zapotecos Mitla	Zapotecos Tehuantepec
Stature	—	—	157.5	157.2	158.6	160.5
Cephalic ind.	84.1	83.6	85.1	84.3	81.0	81.1
Face ,,	86.1	88.7	84.9	85.4	80.8	78.7
Nose ,,	70.6	69.2	74.0	71.3	81.9	80.0

Monte Alban and Cerro de las Mesas may be jointly considered owing to their mutual strong resemblances. Both of them should be included in the limits of the Maya-Totonacan type what shows comparison in table 6. In fact, Monte Alban a.p.-type is almost identical with that of the Huastecs from Tantoyuca. But, strangely enough, it differs markedly from the present day Zapotecos from Mitla and Tehuantepec which clearly belong to the Paleo--Otomangue complex. Perhaps, the urban population related to Monte Alban civilisation was far more "mayanised" and the recent Zapotecos are survivals of a more original population.

Now, the question of the affinities of very small but very interesting series from Monte Negro may be considered. It was preliminarily published by J. Romero (1951) who informed about its dating to the preclassic Monte Alban I phase. The comparison which yields table 7 shows clearly a certain distinctness of this series. First of all, what already Romero rightly ascertained, the Monte Negro crania are distinguished by definite dolichocephaly. According to the present their description they reveal also much broader nose and specifically "Olmecoid" low figures for both $\overline{P}$-position indices. These differences yet increase when the bizygomatic diameter will be included. Namely, it is much more narrow in Monte Negro. So then, the total pattern of Monte Negro a.p.-type may be viewed as a more sharpened Tlatilco type, still more shifted in the "Olmecoid" direction. This anthropological finding is fully concordant with archeological information (see, for example, "Danzantes").

Finally, there remain the Prehispanic Yucatan Maya and very resembling the Zacatenco&El Arborillo a.p.-type. The comparison which represents table 8 shows again the undoubted affinities of both these series to the Maya--Totonacan type on the living, especially to the a.p.-types of Totonacs from Papantla which is most brachycephalic among all Amerindians in Mexico. At the same time, some differences in reference to the Prehispanic population from Yucatan should be stressed. Namely, present day Maya and Yucatecos show lower face and far more narrower nose. Thus, the Prehispanic Maya represent more ancient a.p.-type which was less modified by the Nahuan influence.

However, the position of the Zacatenco & El Arborillo a.p.-type which so much resembles brachycephalic Maya type is very difficult to explain. If its dating on the early phase of Preclassic Period is right, it would be real mystery. Is it possible to assume that a Proto-Mayan migration reached the Valley of Mexico? The situation will not be improved by very small volume of the series because, in this case, a most frequent type in the population will be usually represented. Of course, another convergent center of braychcephalisation might be assumed in the Valley of Mexico but, if so, why did it disappear completely in the modern times? So, this question must remain open for further investigations.

Table 7

Comparison for Monte Negro

Trait/a.p.-type	Monte Negro	Monte* Alban
Cephalic ind.	76.7 (7)	83.1 (15)
Height-length	75.9 (2)	79.0 (69)
Height-breadth	105.0 (2)	95.7 (9)
Upper fac. Kolm.	53.3 (4)	51.0 (14)
Upper fac. Vir.	69.7 (4)	70.4 (17)
Nasal	50.0 (4)	47.9 (17)
Orbital	88.1 (4)	83.6 (17)
Bizygomatic diameter (m.)	136.5 (2)	143.6 (14)
Bizygomatic diameter (f.)	128.0 (4)	135.5 (2)
$\bar{P}$-index: B.-Y.	51.6 (5)	56.7 (38)
$\bar{P}$-index: Y.-W.	51.3 (6)	57.9 (38)

* Monte Alban series includes here only undeformed crania

Table 8

Comparison for Yucatan-Maya

Trait/a.p.-type	Yucatan Maya Prehisp.	Yucatec Maya	Totonac-Maya	Totonacos Papantla	Zacatenco El Arborillo Preclassic
Stature	—	155.5	157.5	158.0	—
Cephalic ind.	90.6	85.5	85.1	88.2	87.0
Face ,,	87.8	84.0	84.9	86.2	89.8
Nose ,,	70.7	65.0	74.0	73.0	72.5

At any rate, all these taxonomic considerations based on the analysis of average populational types may be far more deeply conceived in the light of their intrapopulational differentiation.

RESULTS OF INDIVIDUAL TAXONOMIC ANALYSIS

As it was mentioned above, the individual diagnoses of racial affinities of particular crania have been established according to the procedure of the Comparative-Morphological Trend of the Polish Anthropological School which is based on strictly individualistic conceprt of human races regardless their populational descent. Since the procedure has been many times discussed in a detailed way and published, there is no necessity to describe it here. Also, the descriptions of a majority of the distingushed racial types will be published soon in the third volume of the Proceedings of the XXXVIII th Intern. Congress of Americanists held in Stuttgart in 1968.

The ultimate results of individual typing represents table 9 where percentages of the individual racial types are included (so called: typological compositions of the series). In spite of the small number of diagnosed crania within particular series, some striking regularities clearly appeared. First of all, presumably the oldest series from Zacatenco & El Arborillo comprises only the representatives of the Yellow variety, i. e. the Subpacific (LZ), Lowland (MZ) and Central Asiatic (ML) types. The same Subpacific (LZ) type is present in all the remaining series constituting, perhaps, their very core. Then, high percentages of the Subainuid (PZ) type appeared within both Olmecoid series from Tlatilco and Cerro de las Mesas, Monte Alban and Teotihuacan being lacking in Yucatan Maya. Also, the presence of the Armenoid (H) element in its various derivations in these series must be emphasized. But, a most strange result is a discovery of the presence of the Dongolian (HX) and Bushmenoid-Armenoid (HN) types within "Olmecoids", which are absent in Teotihuacan and only scarcely seen in Monte Alban.

Rather complicated and more subjected to sampling errors typological compositions may be reduced to the racial compositions which show, phenotypically expressed, intensity of extreme combinations of traits, i.e. those of the racial elements (=races). Table 10 represents the latter compositions calculated for all the studied Prehispanic series by use of the halving method of Michalski. Now, the picture is more clear. Thus, Zacatenco &El Arborillo series revealed a unique presence of only 3 racial elements: Pacific (z), Mongoloid (m) and Laponoid (l). First of them has been concentrated from very ancient times in Northern China (its probable cradle), Corea, Manchuria and in Japan, starting from the Bronze epoche. It is dolicho-mesocephalic, with tall stature, long face, somewhat flattened, narrow and long nose, low to medium prominent, oftenly convex high cranial vault and high orbits. The

Table 9

Typological compositions of Prehispanic series of crania in Mexico (m.+f.)

Individual racial/Series, No type	Zacatenco El Arborillo 1	Tlatilco 2	Cerro de las Mesas 3	Monte Alban 4	Teotihuacan 5	Yucatan Maya 6
Ainuid (P)	—	1.9	—	—	—	—
Armenoid (H)	—	3.9	—	5.6	—	2.7
Laponoid (L)	—	—	—	2.8	—	5.4
Mongoloid (M)	—	—	—	2.8	8.3	—
Pacific (Z)	—	7.7	—	2.8	—	—
Ainuid-Armenoid (PH)	—	—	—	8.3	—	2.7
Subainuid (PZ)	—	13.5	27.3	11.1	25.0	—
Ainuid-Arctic (PI)	—	1.9	—	2.8	—	—
Ainuid-Equatorial (PX)	—	—	—	2.8	—	—
Alpine (HL)	—	1.9	—	8.3	8.3	2.7
Turanian (HM)	—	—	—	16.7	—	8.1
Anatolian (HZ)	—	3.9	—	2.8	25.0	10.8
Armenoid-Bushmenoid (HN)	—	3.9	9.1	—	—	—
Dongolian (HX)	—	19.2	—	2.8	—	2.7
Ceneral-Asiatic (IM)	16.7	—	—	2.8	8.3	8.1
Subpacific (LZ)	66.7	38.5	63.6	22.2	16.7	43.2
Baikalian (LI)	—	—	—	2.8	—	—
Laponoid-Equatorial (LX)	—	1.9	—	—	—	—
Lowland (MZ)	16.7	—	—	—	8.3	10.8
Pacific-Equatorial (ZX)	—	1.9	—	2.8	—	—
Ainuid-Mongoloid (PM)	—	—	—	—	—	2.7
Number of diagnosed crania	6	52	11	36	22	37

Remarks: compositions calculated in % for all the series which do not exceed 30 crania possess only very approximative and prospective value: it should be most firmly emphasized that all the used names for particular racial types must be regarded as mnemotypical devices and that they denote only phenotypical correspondance of a given Old World type to that one from Mexico; these individual types, i.e. patterns of traits should never be understood as populational types or races.

eye-frame is not typical mongoloid, with so called "semitic" upper eye-lid. Also, stronger subnasal prognathism should be stressed. All the remaining features show clear affinities of the Yellow variety.

The Mongoloid race (M) is characterised by extreme brachycephaly, medium high to high stature, very high cranial cault, rather short and very flattened face, broad and flattened nose, medium high orbits and all the classic traits of the Yellow variety. This element is concentrated in Mongolia and densely distributed over the vast steppe region of Central Asia.

The Laponoid race, well known among Lapps, has very wide distribution, from mountaineous regions of Europe, through North-Eastern Europe, Sibiria then, southwards it reaches, through Southern China, Indochina and Indonesia. It is brachycephalic, with short stature, short and round face, moderately broad and short nose, low orbits and descriptive traits which occupy intermediate position between Yellow and White variety.

Then, it comes the question of the Ainuid (P) race, so typical for Aino populations in Sakhalin, Gilyaks and other paleoasiatic tribes of Northern Sibiria, perhaps, the most ancient component of Japan. Probably, it is the main element of Birdsell's Amurian race. It belongs clearly to the White variety in all the descriptive traits. The stature is low, face short, orbits low to medium high, nose very broad but not flattened, rather primitive cranial relief and there appears a slight tendency towards mesognathism. Its presence within Mexican crania is undoubted and is evidenced for Paleoindian Period by Tepexpan Man which belongs to the Subainuid (PZ) type. Its most ancient appearance in Eastern Asia reveal certain crania from the Upper Cave in Chou-koutien. Michalski connects genealogically this race with the Berberic (B) race, a most typical component of Dravidian India and Hamitic populations. Since the Ainuid race appears in all the studied Preihispanic series, with exception of the series No 1 which is, perhaps, too small to reveal its admixture, it could be regarded as the component of the most archaic anthropological background. The investigations of the present author on the living material (see: A. Wierciński, 1970), revealed clear conexions of the Ainuid race with the Otomangue stock of languages. However, not only Ainuid element went into Paleoindian populations. Most probably, there were also included Eastern Asiatic component. i.e. mentioned above Pacific race and descending from paleoarctic populations, the Arctic (I) race of which admixtures could be discerned in Tlatilco. This is typical component of the present day Eskimo groups, so excellently described by L. Oschinsky (1964).

It is still doubtful whether some admixtures of the Laponoid race were present too among these archaic populations of Big Hunters since the known fossil finds are dolicho-mesocephalic.

The very core of the Preclassic populations in Mexico seems to be created

by the Pacific, Mongoloid and Laponoid elements which could indicate another migratory wave, more connected with Eastern Asia and, indirectly with Central Asia. It should be noted that Nahuan living populations are related to high shares of the Pacific & Mongoloid components while those of the Totonac--Mayan — with a prevalence of the Laponoids (see again: A. Wierciński, 1970). If it is true for the Pre- and Classic Periods, in all the studied series of Prehispanic crania, a strong Nahuan penetration would be assessed, being the least in Monte Alban, where a Paleo-Otomian substrat is the strongest. At the same time, the strongest amount of true brachycephals appeared logically within Yucatan Maya and Zacatenco+EL Arborillo. Then, it comes "mayanized" Monte Alban. The Teotihuacan in all respects occupies intermediate position with both Paleo-Otomian, and Mayan structures strongly influenced by the archaic Nahuan one. Now, what can be said about "Olmecoids" from Tlatilco and Cerro de las Mesas?

Both these series are clearly distinguished by the presence of two very strange patterns of traits, i.e. those of the Black variety and brachycephalic White component. They were already seriously suspected in the cranioscopic analysis based on the $\overline{P}$ — position indices. At present, a more detailed data of the individual typing of crania allow to precise more deeply the racial affinities. Thus, a second White element (besides of the Ainuid race) is characterised by strong brachycephaly, high cranial vault, high orbits, rather high face, narrow and extremely prominent nasal bones with high nasal root, very prominent nasal spine, sharp lower border of the nasal aperture, not prominent forward zygomatic arc, and deep canine fossae and maxillary incisures. All these traits represent specific pattern of the Armenoid race (H), with exception of a tendency towards mesognathism. The Black variety pattern seems to correspond mainly to the Equatorial (X) race, which is concentrated now in Western Africa. It is characterised by a high stature and athletic body build, mesocephaly, rather low cranial vault, long face, very broad nose and medium high orbits. All the remaining features represent classically the Black variety. The Prehispanic crania which show affinites to this element, reveal very flattened nasal bones of rectangular form, strong prognathism, medium deep canine fossae and maxillary incisures, delicate cranial relief and non-prominent zygomatic arcs. In two crania from Tlatilco could be discerned also the traits of the Bushmenoid (N) race which is distinguished by very low orbits, low cranial vault, and platycephaly, not speaking about other features, well known in taxonomy. This finding would agree well with steatopygous female figurine with clear Negroid traits found in Tlatilco and published by R. Pina Chan (1959). Of course, both these Black variety components did not appear in completely pure form but, strangely enough, usually in combination with some affinities of the Armenoid element (see: A. Wierciński, 1969). So then, the present author has suggested that all these exotic

Table 10

Racial compositions of Prehispanic series of crania from Mexico

Racial element/Series, No and symbol	Zacatenco El Arborillo 1	Tlatilco 2	Cerro de las Mesas 3	Monte Alban 4	Teotihuacan 5	Yucatan Maya 6
Ainuid+Arctic (p+i)	—	10.6	13.6	15.3	12.5	2.7
Armenoid (h)	—	18.3	4.5	25.0	16.7	16.2
Laponoid (l)	41.7	21.8	31.8	20.8	16.7	32.4
Mongoloid (m)	16.7	—	—	12.5	16.7	14.9
Pacific (z)	41.7	36.5	45.5	22.2	37.5	32.4
Equatorial+Bushmenoid (x+n)	—	13.5	4.5	4.2	—	1.4

Remarks: these compositions expressed in % denote relative phenotypical intensity of the assumed racial elements which appear in the intermediate types or in their own specific patterns of traits: they were calculated by use of the Halving Method of Michalski based on the assumption of strictly intermediate position of composed types between the extremes, i.e. racial elements.

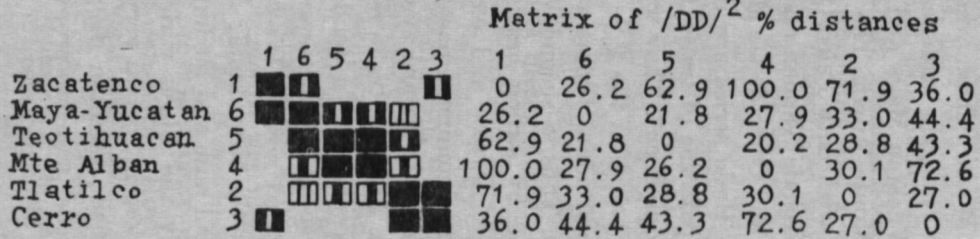

Fig. 5. Diagram of succesive $(DD)^2$% distances between racial compositions (upper limit of similarity = 39,1 %)

in Mesoamerica components came jointly from outside. He indicated the Afro-Iberian area of Megalithic cultures (like, for instance, Los Millares) as a possible source for transatlantic migrants. If this working hypothesis would be, at the moment, accepted, a mathernal for high cultures in Mesoamerica Olmec civilisation would be craeted by a very heterogeneous population which arose in Vera Cruz as a blend of all the 3 primary Amerindian elements, Otomangue, Nahuan and Mayan in which had been introduced foreign band of sporadic immigrants from The Western Mediterranean area. However, the presence of the classic representatives of the Pacific race in Mexico, so characteristic for the Nahuan groups could be also related directly to North China of the Shang period. In this case, besides of the native Pacifics descending from the older, continental migration, a new transpacific migration would be accepted. Unfortunately, it is impossible, at present, to verify this hypothesis since the same racial element must be taken into account in both cases. Perhaps, a verification will come from the cultural data.

In any case, the presence of the Black variety components, most probably, should not be regarded as merely the products of a natural polimorphism of Amerindian populations, promoted by the action of natural selection working in a tropical environment. Such an explanation would necessarily demand high shares of the Negroid patterns in Brasil and Guyana what has not been proved, as yet. Also, if so, so why in the Lowland Maya the Equatorial admixture almost disappears while it is strongely represented in Tlatilco from the dry Valley of Mexico? The Negroid admixture shows too a tendency towards disappearing in the Classic Period, as it is evidenced by Cerro de las Mesas. However, it is worthy of mention here that it is included in the Monte Alban series, mainly in its Monte Negro subsample dated to Monte Alban I. This finding clearly joins Monte Alban population with "Olmecoids". The same may be said about highest incidence of Armenoids in Monte Alban.

Returning back to the question of the Negroid pattern, someone may advance a hypothesis of its East Asiatic, or South-East Asiatic derivation. However, the investigations on Neolithic and Shang series from Northern China carried out by Davidson Black or, lastly, by Yen Yin did not discern any Negroids there. The same should be stated for Japan of the Jomon period (see: Howells, 1966). The supposed by Ford transpacific migration to Ecuador which created Valdivia culture also includes only information about Asiatic brachycephals (see: Ford, 1969). So, there remains, perhaps, only Indonesia as possible source for the Negroid or even White patterns (as it was lastly suggested by Prof. Bosch-Gimpera in the private letter to the present author). However, in the latter case, it should be observed rather a relation to the Negritoid element. But, just in Tlatilco, the Negroid crania did not show any correlation with lower stature or small size of the cranium (see: A. Wierciński, 1968a).

At any rate, a joint presence of the Armenoid and Equatorial constellation of traits is typical for the Olmec populations in Mexico!! For the sake of possible opponents of the Mediterranean derivation of Mexican Armenoids, the present author proposes yet another explanatory hypothesis. Namely, it is possible to imagine that the Armenoid constellation of traits could appear in Mexico convergently, on a basis of reasorting process acting it the frame of the Subpacific (LZ) type. The Laponoid brachycephaly together with more Europoid eye--frame and the morphology of maxilla had been recombined with a fraction of the Pacific race having more prominent, narrow and convex nose together with "semitic" upper eye-lid. This process of creation of a new polygenic block could occur somewhere in a dry and mountaineous area of Northern Mexico which would demand adaptationally well profiled noses and faces. Perhaps, similar process should occur, as well as, in Northern China, a classic meeting place for the Pacific and Laponoid races or, among Andean Amerindians.

However, why the Armenoid pattern did not disappear in the Lowland Maya?

All the mutual relationships between the racial compositions of the investigated series of Prehispanic crania from Mexico represents diagram of shortest $(DD)^2$ distances (see: fig. 5). It shows a chain of interrelated populations. Zacatenco&El Arborillo is related to the Yucatan Maya and these with Teotihuacan. The latter series is joined closely with Monte Alban which, successively, passes into the last group formed by the "Olmecoid" series from Tlatilco and Cerro de las Mesas. Thus, it was received a picture only slightly different from the previous diagrams based on the average populational types expressed in the cranioscopic facial traits.

Finally, the present author made comparisons of raciological description of pieces of the Olmec and Maya-Toltec art with the racial types distinguished on the basis of craniological analysis (see: A. Wierciński, 1968a). The results were striking. It appeared that, with exception of the Ainuid and Arctic derivations, the remaining racial types found their strict correspondants in full and bas-reliefs, as well as, among figurines. This regards not only the Subpacific (LZ), Lowland (MZ) Pacific (Z) and other representatives of the Yellow variety but also and especially, the Armenoids and Equatorials. However, the latter analysis will be published in a detailed way in a separate publication.

ACKNOWLEDGEMENTS

The present author would like to express his best thanks to Dr. E. Davalos Hurtade, the deceased Director of INAH in Mexico for His kind invitation and financial support of author's scientific stay in Mexico, as well as, to Prof.

Dr. Arturo Romano, the present Director of Museo Nacional de Antropologia and the Head of the Department of Physical Anthropology at INAH who gave all the possible help and kind permission to study all the Prehispanic series of crania, then, to Prof. Dr. F. Montemayor whose friendly advices and other assistance helped very much the author's studies on the Olmec art. Also, the author thanks to all the Members of Scientific Staff of the Department mentioned above for Their great technical help. Finally, the author is much indebted to Mr H. Rysiewski, the scientific assistant of the Division of Anthropology at the Department of Prehistoric Archeology of the Warsaw University for drawings and to Mr P. Brykczyński for His kind help in a following the ethnolinguistic affinities of the studied human groups.

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