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Racial taxonomy of some past and living populations in Peru

Andrzej Wierciński
Department of Historical Anthropology,
Institute of Archaeology, Warsaw University

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General remarks

In contemporary anthropology exist four main concepts of human races:

1. the concept of geographic races which recognises as the race a set of territorial human groups, similar to each other in a complex of racial traits and bound by a hypothetical common descent;
2. the populationistic concept which makes equivalent the notion of the race with the notion of a breeding population (usually, an ethnic, political or social unit) or, with a group of populations similar to each other in their alle-typic or heritable phenotypical characteristics;
3. the concept of the racial clines which rejects the notion of the race as a real biological entity and deals only with regularities in the spatial distribution of single geno- or fenotypical characteristics of the regional human groups;
4. the concept of individual races (individual typology) which utilises the notion of the racial type to denote a group of human individuals irrespective their populational descent and resembling each other in a set of racial traits.

It is easy to demonstrate that all those four approaches to human raciology are mutually complementary and yield information of their own.

However, since the notion of the race is used in different meanings and is based on different kinds of the departure material for classification, consequently, the products of the latter in the form of particular geographic and populational races, racial clines or individual racial types are never equivalent in their taxonomic contents. In order to show the theoretical differences between various raciological conceptions, much debatable individual typology has been contrasted with the populational concept, what represents Table 1. Of course, this comparison refers also, to some extent, to the concept of geographic races which merges with the populationistic one.

This paper will deal only with the taxonomy of some past and living Peruvian populations within the conceptual frame of the first two conceptions (1.1 and 1.2). This state of affairs results from a lack of satisfactorily published individual measurements and scopic characters which could serve as a good basis for applying the procedures of individual typology. Therefore, the multivariate analysis will be applied to frequency distributions of serological and epi-genetic characteristics, i.e. traits of a simple mode of inheritance, so likely used in populational taxonomy, as well as, to the average populational morphotypes. This analysis will embrace the published data for Peruvian populations shown on the background of a larger sample of other Amerindian tribes, since the solution of the problem of kinship relations between human populations needs wide comparisons in time and space.[1] Their extent, however, is limited and it varies for different sets of traits according to the published information.

The analysis of serological data

The material of various serological characteristics examined for different Amerindian tribes was mainly taken from the successive papers published in American Journal of Physical Anthropology, starting from the year 1950. The multivariate analysis consisted of calculating the matrices of simple DD-distances, graphically represented in the form of symmetrical diagrams of successive differences of Czekanowski. Such simple device for estimation of interpopulational distances has been selected, instead that of Sanghvi and Smith, because the present author does not believe in the taxonomic necessity of a special stress laid upon low frequencies in serological distributions. Also, there were considered only the serophenotypes to be nearest to empirical reality.

The diagrams were already published by the present author in one of his papers[2] and, they will be repeatedly analysed here, in reference to taxonomic position of Peruvian series. Thus, the Diagram I (Fig. 1) based on ABO blood system, shows the division into 5 different groupings (clusters) of variable size and three isolated series. The first group embraces one Eskimo series from the Baffin Land, Apachees, Penobscot, Shoshoneans and Flathead. It is characterised by balanced frequencies of A and 0 and, by very low of the rest, i.e. B and AB/A: 42–48%, B: 0–5%, AB: 0–2%, 0: 51–55%. The second group, less compact, includes three Eskimo series from the Western and South-Western Greenland and Alaska which show greater admixtures of A and AB and lesser frequencies of 0/A: 45–55%, B: 3–12%, AB: 1–6%, 0: 36–41%. The third group consists of two series from Montana (Blackfoot and Blood) distinguished by very high shares

[1] A. Wierciński: The applications of anthropological investigations to the field of ethnogenesis, [in:] "Congres Intern. Sc. Pre-Protohistoriques", Prague, 1971, p. 1248–1252.

[2] A. Wierciński: Znaczenie cech serologicznych w antroposystematyce, "Przegląd Antropologiczny", vol. 32, 1966, p. 97–111.

Table 1: Parallelisation of the populationistic and individualistic concepts of human races.

Question	Populationistic concept	Individualistic concept
1. Direct aim of taxonomical procedures	Appreciation of taxonomical differentiation of breeding populations of heritable phenotypical and genotypical characteristic	Appreciation of taxonomical differentiation of individuals irrespective their populational descent in the set of heritable phenotypical or genotypical characteristics
2. Primary objects of the departure material for classification	Breeding populations	Individuals
3. Criteria of distinguishing the primary objects	Ill-defined isolating barriers of inbreeding process, permanently changing in time and space	Well-defined time-spatially surface of the individual body
4. Method of description of primary objects for classification	Average types, frequency distributions, allelotypes	Individual characteristics
5. Criterias of inter-group homogeneity	Testing of statistical representativeness of samples derived from a general population and random distributions of individual characteristics	Relative similiarity of individuals greater than intertype differences
6. Degree of intragroup variability	Usually great, greater than interpopulational variability	Small, usually narrower then populational variation
7. Taxonomical units	Populational races of ill-defined systematic ranks	Racial varieties, racial elements, intermediate types
8. Common genetic assumption	Independent sorting of a number of genes	Pleiotropic effects, polygenic blocs, genetic linkages

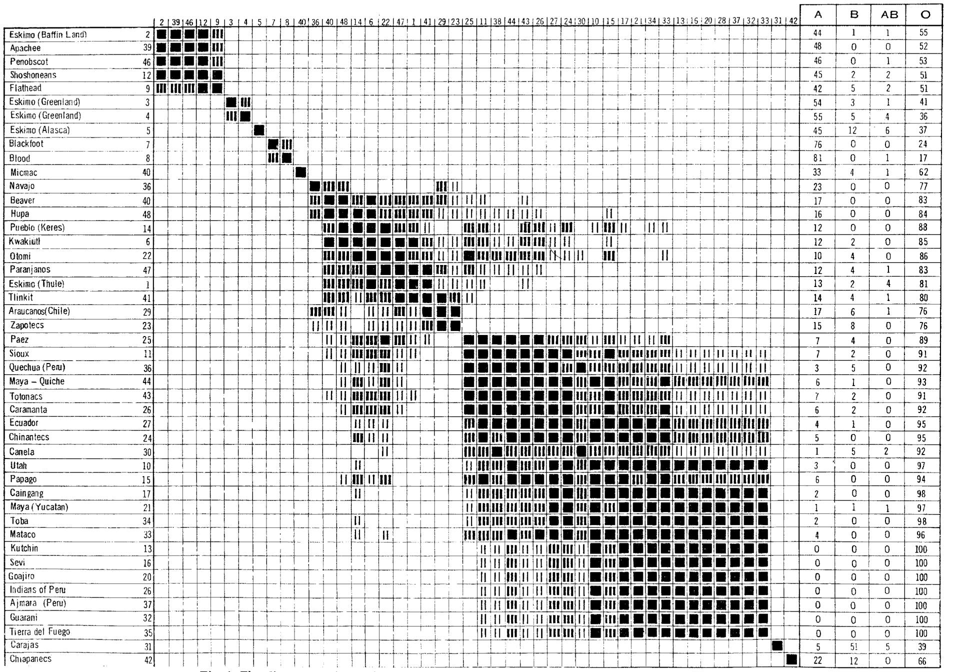


Figure 1: The diagram I of DD distances between frequency distributions of AB0 blood system.

of A and definite decrease of 0 (A: 76–81%, B: 0%, AB: 0–1%, 0: 17–24%). Then comes the isolated series of Micmac owing to the reversion of the proportion of 0 (62%) to A (33%) with slight admixtures of B (4%) and AB (1%).

The fourth large grouping is composed of the series of Navajos, Reaver, Hupa, Pueblo, Kwakiuti, Olomi, Paranjanos, Eskimo from Thule, Tlinkits, Araucans and Zapotecs, characterised by definite prevalence of 0 (76–88%) over A (10–23%), with slight admixtures of B (0–8%) and AB (0,4%). This group is closely related to the next fifth group which embraces entirely different series from both North and South America. All of them are distinguished by absolute prevalence of 0 (88–100%) over the rest (A: 0–7%, B: 0–5%, AB: 0–2%). The lower end of the diagram is occupied by the isolated series of Carajas showing unusually high frequency of B (51%) with lowering of 0 (3,9%) and slight admixtures of A (5%) and AB (5%), and Chiapanees who are similar to Micmac but differentiated by higher share of B (22%).

Generally speaking, the diagram I of ABO system shows undoubted heterogeneity of Amerindians and, with few exceptions, the appearance of clusters clearly inconsistent with geographic-historical and racial positions. For example, so different populations as Eskimo and Paranjanos, Otomi and Kwakiuti, Tlinkits and Araucans or Chinantecs and Canela became close neighbours.

The three series of Quechua and Aymara from Peru were found in one, fifth group of the diagram, being characterised by absolute prevalence of 0 which joins them together with so different populations as Sioux, Paez, Maya–Quiche,

Table 2: The matrix of Smith's distances between compositions in 30 epigenetic traits of the cranium.

Series	1	2	3	4	5	6	7	8	9	10	11
1. Egipt	0.000	0.025	0.045	0.008	0.010	0.143	0.070	0.214	0.294	0.125	0.589
2. West Africa (Ashanti)		0.000	0.048	0.004	0.009	0.178	0.074	0.208	0.403	0.174	0.632
3. Palestine (Lachish)			0.000	0.027	0.040	0.202	0.167	0.137	0.301	0.237	0.630
4. India (Pendjab)				0.000	0.014	0.101	0.045	0.184	0.228	0.118	0.571
5. Burma					0.000	0.137	0.065	0.184	0.336	0.143	0.609
6. North America (British Columbia)						0.000	0.075	0.182	0.234	0.110	0.670
7. Peru							0.000	0.219	0.322	0.145	0.703
8. Tlatilco ("El tipo habitual")								0.000	0.253	0.109	0.442
9. Tlatilco ("El tipo differente")									0.000	0.086	0.296
10. Tlatilco (total)										0.000	0.438
11. North America (Sam, Oklahoma)											0.000

Caramanta, Utah, Kutchin, Guarani etc. If so, the interpopulational variability in ABO blood system did not permit to establish meaningfully the taxonomic positions of Peruvian groups.

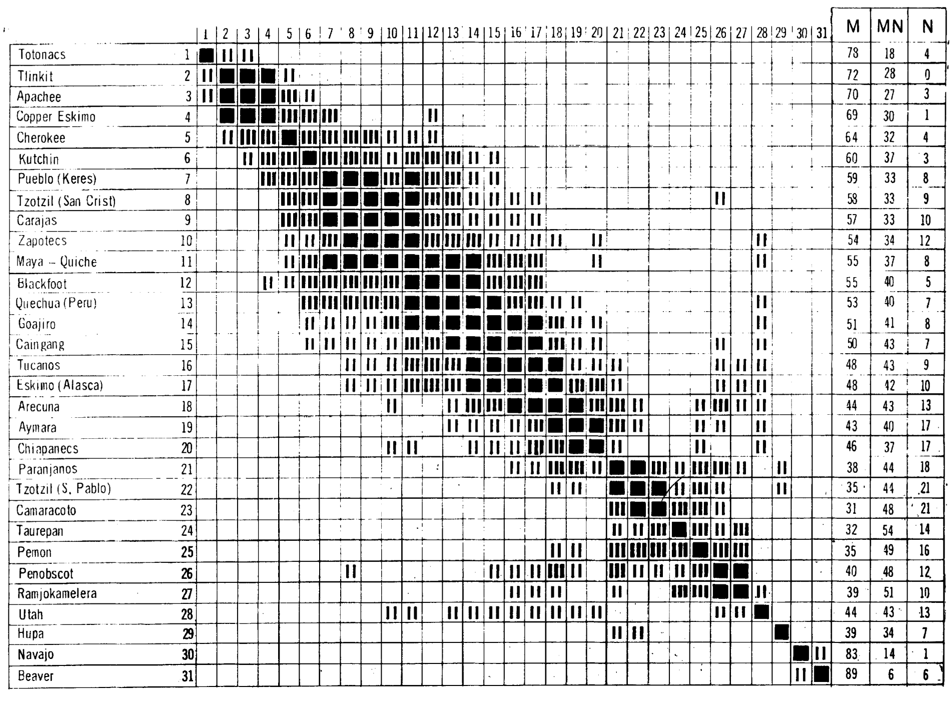


Figure 2: The diagram II of DD distances between frequency distributions of mN blood system.

Unfortunately, the situation is not very different in the case of the Diagram II (Fig. 2) based on MN blood system which also shows more fluent transitions between clusters.

The first group consists of Tlinkits, Apachees and Copper Eskimo which are characterised by prevalence of M (69–72%) over MN (27–30%) and by slight admixture of N (0–3%). The more isolated series of Totonacs shows still greater share of M (78%) and the lesser one of MN (18%) and N (4%). Also isolated series of Navajos and Beaver from the lowest end of the diagram are shifted towards the same direction owing to their prevalence of M (83–89%).

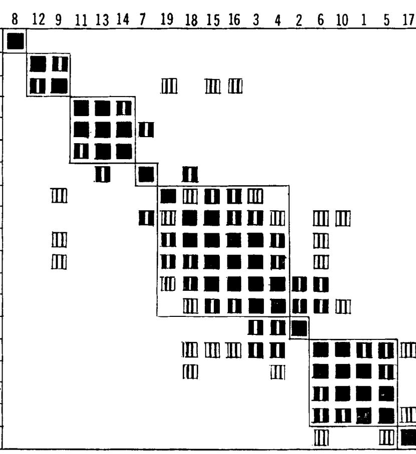
The greatest, second group of the Diagram II is composed by racially and geographically distant populations. The several centers of this group arose because of the variation of high frequencies of M (43–64%) and MN (32–43%). We meet here Cherokees, Kutchin, Pueblo-Keres, Tzotzil, Carajas, Zapotecs, Maya–Quiche, Blackfoot, Quechua from Peru, Goajiro, Caingang, Tucanos, Eskimo from Alasca, Arecuna and Aymara from Peru.

The third group consists of the series of Paranjanos, Tzotzil, Camaracote, Taurepan, Pomo, Penobscot and Ramjokamelera. They reveal rather uniform distribution of M, MN and N (M: 31–40%, MN: 44–45%, N: 10–21%). A more isolated series of Utah with M–39%, MN–34% and N–7%, is connected with both groups of the diagram while the series of Hupa still more isolated, is characterised by M–39%, MN–34% and N–7%.

Thus, in the case of MN blood system a greater degree of heterogeneity of Amerindians may be also observed, together with some undoubted meaningless taxonomically relations.

Here, both Peruvian series of Quechua and Aymara are close together but to the same extent as with the other, very distant geographically and racially populations from both American subcontinents.

It might happen however, that this taxonomically illogical situation would be improved, if all the available blood systems would bo simultaneously considered.



		A	B	MS	MS	NS	R^z	R^1	R^z	K	Fy^a
Blood (Montana)	8	58	1	30	57	7	4	47	40	0	75
Escimo (Alasca)	12	36	9	16	66	0	0	48	51	0	79
Pawnee	9	23	1	14	69	5	6	45	40	2	65
Kutchin	11	0	0	19	59	9	0	21	76	0	100
Indians (F. Yukon)	13	8	0	16	65	7	1	29	62	0	100
Tlinkit	14	8	3	13	73	2	1	25	60	1	100
Chippewa	7	6	0	30	42	5	2	32	59	8	87
Quechna (Peru)	19	2	3	23	50	3	13	34	38	0	62
Aymara (Peru)	18	0	0	23	37	7	4	49	47	0	74
Maya (total)	15	2	1	23	52	17	2	52	41	0	68
Non – Maya (Mexico)	16	7	5	22	51	12	2	51	37	0	70
Camaracoto	3	0	0	8	47	11	2	60	36	0	65
Arecuna	4	0	0	9	56	7	5	64	29	0	73
Taurepan	2	0	0	6	53	10	2	81	17	0	83
Cherokee	6	1	1	37	43	8	6	62	29	1	55
Dieguenο	10	1	1	40	36	0	6	68	23	0	68
Goajiro	1	2	2	40	32	4	1	78	17	0	67
Paranjanos	5	6	2	34	27	13	1	65	20	0	63
Pemobscot	17	27	0	26	38	6	0	52	20	0	54

Figure 3: The diagram III of DD distances between frequency distributions of AB0, MNS, Rh, Kell and Duffy blood system.

This was done in the Diagram III (Fig. 3) which was based on the systems ABO, MNS, Rh, Kell and Duffy.

It shows the division into four clusters and four more isolated series. The series of blood from Montana appeared to be the most isolated one, owing to high shared of A (58%), MS (57%) and Fy^a (75%). Next comes the first group embracing Eskimo from Alaska and Pawnee, with lowered frequencies of A (23–36%), MS (14–16%) and higher shares of R^1 (45–48%), R^2 (40–51%) and Fy^a (65–79%).

The second group includes 3 series from North America i.e. Kutchin, Indians from Fort Yukon and Tlinkits. They are characterised by the decrease of R^1 (21–29%) on account of R^2 (66–76%) and by 100% of Fy^a. This group seems to be taxonomically meaningful.

Then, after transistory position of Chippewa, comes the largest, third group of the diagram with the series of Quechua and Aymara from Peru together with Maya, Non-Maya, Camaracoto and Arecuna. It should be noticed here that, besides of these illogical connections, the Quechua are more related to both Maya and Non-Maya tribes from Mexico than to the Aymara.

Table 3: Mean characteristic of territorial series from Peru i Bolivia compared with racial elements of individual typology according to Wanke's method.

Series	Traits			
	Stature	Cephalic index	Face index	Nose index
Quechua – Peru	158	79	96	90
Uru	160	75	90	69
Chipaya	158	75	86	71
Uru – Aymara	163	81	88	69
"Quechua" – Titicaca	160	85	90	67
Quechua – Bolivia	160	81	76	73
Colla – Aymara Bolivia	160	82	76	71

All the series from this group are distinguished by definite prevalence of 0 (88–100%), moderate frequencies of MS (37–56%), R^1 (34–64%) and R^2 (29–47%), rather high of Fy^a(62–74%), relatively high of NS (3–17%) and R^2 (2–13%) and by a lack of K. The series of Taurepan is closely related to the other Venezuelan series from the third group.

The fourth group consists of Cherokee, Diegueño from California, Goajiro and Paranjanos, what is rather inconsistent with taxonomic point of view. These series show high frequencies of MS (34–40%) and R^l (62–78%) and a decrease of R^2 (17–29%) and Fy^a (55–68%).

The series of Penobscot is slightly connected with the fourth group, being shifted towards higher frequency of A (27%) and a decrease of MS (38%), R^1(52%) and Fy^a (54%). Thus, in the case of multivariate analysis of all the blood systems simultaneously treated, the taxonomical situation becomes much better, though not free from clear inconsistencies.

In order to have exact comparison of diagraphic ordering based on serological characteristics with that of traditional, morphological traits, the Diagrams IV and V have been generated for strictly the same set of populations (Fig. 4).

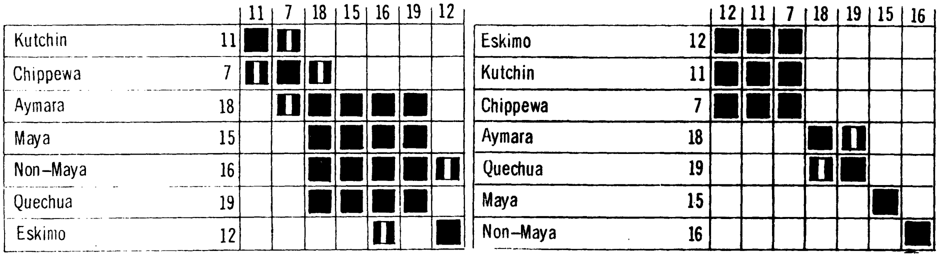


Figure 4: The diagram IV of DD distances of joint distributions of all the blood systems simultaneously considered. The diagram V of DD distances between average populational morphotypes of the same set series whith were appreciated in the diagram IV.

Unfortunately, only very few series could be compared in this way and only 4 morphodiagnostic traits could be considered.

However, already a first glance at both diagrams makes visible the superiority of morphological traits, since the diagram V preserved the meaningful relationships between Eskimo, Kuthhin and Chippewa, at the same time, logically separating Maya from Non-Maya while Quechua and Aymara have formed their own, though, not very compact group.

The best summarizing of the general results of multivariate analysis of serological characteristics seems to supply the following statement of J. Birdsell[3]: "After several decades of cooperative research between serologists and anthropologists the blood group frequencies of the peoples of the world are broadly known. Today it is becoming increasingly apparent that the clines derived from these data do not yield direct measures of relationship between peoples, even though the genetic units used are in themselves clear cut and consistent in their expression and inheritance. The difficulty arises from operation of microevolutionary processes upon the human populations involved. There are ample indications that the frequencies of the blood group genes, like others, are modified by the continously ongoing forces of selection, genetic drift, mutational pressure and hybridisation" (p. 303). Happily enough, it seems that polygenic, morphological traits of traditional raciology are not so changeable in these circumstances!

The analysis of epigenetic data

The adherents of populationistic concept of race prefer to deal with the characters of possibly simple mode of inheritance, in spite of all the warnings brought by the serological traits. Thus, the larger set of 30 to over 70 epigenetic traits of the human cranium, belonging to similar category of simple features, are now in vogue in the "New Anthropology". Unfortunately, only very few populations so far have been epigenetically examined.

[3]J. Birdsell et alii: A blood group genetical survey in Australian aborigines of Bentinck, Mornington and Forsyth Island, Gulf of Carpentaria, "American Journal of Physical Anthropology", Vol. 20, 1962, p. 303–320.

In this paper, only the data published by L. H. Berry and A. Vargas[4] could be taken into account with one general series from Peru. Its taxonomic position on a world-wide range demonstrates matrix of Smith's distances, calculated for 30 characters (Table 2) collected in order to characterise uniformely possibly large number of the living Amerindian populations. Thus, the arithmetic means of stature and three cephalometric indices (cranial, facial and nasal) must suffice here.

The results are rather astonishing since the Peruvian series appeared to be hardly distinguishable from Punjab, ancient Egypt and West African Ashanti, being at the same time sharply different from all the Amerindian series, both from Mexico and North America!

Another equally inconsistent result with any reasonable taxonomy is that Egypt shows completely the same epigenetic composition as Burma, Ashanti as Punjab and Burma or, Punjab as Burma, while all the Amerindian series clearly differ from each other. Also, "El tipo habitual" of Vargas from Tlatilco is more similar to Old World series than his "Tipo differente" does. Would it not lie better to reverse these names? It should be noticed that G. P. Rightmire[5] has shown undoubted inferiority of epigenetic traits in reference to the classic set of craniometric traits used in the taxonomy of the Bantu tribes.

Thus, the epigenetic compositions not only did not enlight the taxonomic position of Peru but even obscured it to the extent of a sheer nonsense!

The analysis of anthropometric data

Most unfortunately, as it was stated above, only very few anthropometric data could be collected in order to characterise uniformely possibly large number of the living Amerindian populations. Thus, the arithmetic means of stature and three cephalometric indices (cranial, facial and nasal) must suffice here.

All the material of these average populational types were taken mainly from the exhaustive publication edited by R. Biasutti[6] who with his collaborators utilized consequently the concept of geographic races.

The matrix of simple DD–distances (calculated with dividing stature by 2 to make it equivalent to indices in segregating value) served as the basis for constructing Czekanowski diagram Diagram VI of Czekanowski (Fig. 5).

Unexpectedly, the diagram demonstrated in general very logical picture of interpopulational relationships, in spite of so limited number of traits.

First of all, its division into clusters of similar to each other populations shows distribution according to geographic principle, i.e. Northern Amerindians have been nicely separated from the Southern ones, with few interesting exceptions. Thus, the upper centre of the largest cluster which forms the third group of the diagram consists of 3 Eskimo series from Northern America, Kutchin and Chippewa, while the lower centre comprises Nascapi, Salish-Shuswap, Shasta, Bilcula, Chilcotin, Kwakiuti and Navajos. The upper centre is characterised by

[4] A.Vargas: Estudio de los caracteres craneanos discontinous en la poblacion de Tiatilco. Escuela Nacional de Antropologia e Historia, Mexico 1973.

[5] G. P. Rightmire: Cranial measurements and discrete traits compared in distance studies of African Negro Skulls, "Human Biology", Vol. 44, 1972, p. 263–275.

[6] R. Biasutti et alii: Le razze e i popoli della terra. Torino 1959.

low to, medium stature (163 – 166), mesocephaly (78 – 80), short to medium high face (83 – 87) and not very broad nose (67 – 72). The lower centre is shifted towards higher stature (164 – 171), brachycephaly (81 – 86), shorter face (81 – 85) and broader nose (73 – 76). Perhaps, the upper centre suggest blending with the Arctic racial component in the meaning of individual typology of the Polish Anthropological School, while the lower one – a prevalence of the Mongoloid, high statured and brachycephalic element.

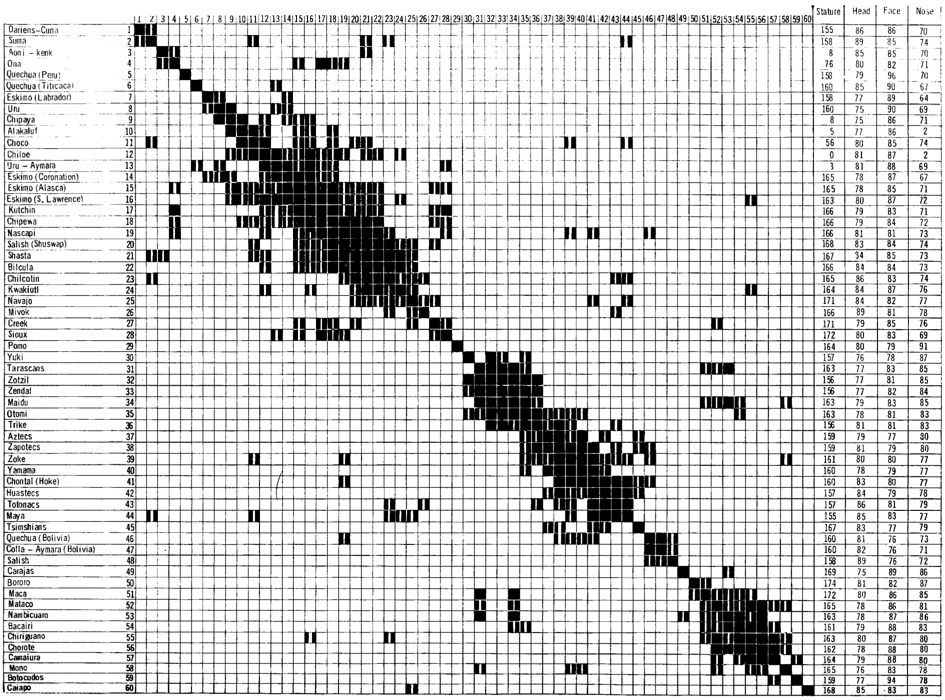


Figure 5: The diagram of DD distances between average populational morphotypes of Eskimo and Amerindian series (living material).

At present, it should be noticed that Uru-Aymara and Chiloe belong still to the upper centre of the third diagraphic group which passes, then, in its upper wing of a more dispersed structure. This wing includes Choco, Alacaluf, Chipaya, proper Uru and Eskimo from Labrador. The latter two series make possible to precise the deviation of the upper wing consisting of lower stature (156–163), dolicho mesocephaly (163–81), long face (85–90) and narrower nose (64–74). The more extreme values corresponding to Eskimo from Labrador settle simply clear prevalence of the Arctic element. In the case of Uru and Chipaya, as well as the Alacaluf, it should be interpreted as definitely Paleoeskimid orgin. If so, Imbelloni's assessment of the presence of Fuegide in Peru would be well substantiated.

But, both series of Quechua from Titicaca and other mountainous regions of Peru occupy very isolated position. The first series is markedly distinguished by its low stature (160), brachycephaly (85), very long face (90) and medium

Table 4: Racial composition (according to Wanke method).

Series	Elements				
	p	*l*	*z*	*m*	*i*
Quechua – Peru	0.13	0.13	0.23	0.07	0.44
Uru	0.09	0.08	0.13	0.04	0.66
Chipaya	0.23	0.17	0.11	0.05	0.44
Uru – Aymara	0.11	0.18	0.34	0.09	0.28
"Quechua" – Titicaca	0.11	0.20	0.28	0.12	0.29
Quechua – Bolivia	0.18	0.58	0.07	0.09	0.08
Colla – Aymara Bolivia	0.16	0.53	0.09	0.11	0.11

narrow nose (67), while the latter one is characterised by still lower stature (158), mesocephaly (79), extremely long face (96) and moderately broad nose (70). The type of the first series might correspond well to Imhelloni's Andide and that of the second one to J. A. Vellard's Altiplanide.[7]

Moving upwards, we meet in the diagram two small groups related to the centre uf the third group. These are: Aoni-Kenk and Ona, characterised by their very high stature (176–178), mesobrachycephaly (80–85) and moderately broad nose (70–71). The second group was constituted by Suma and Dariens shifted towards very low stature (155–158), strong brachycephaly (85-86), medium long face (85–86) and moderately broad nose (70–74). Thus, the first of three groups corresponds to Imbelloni's Pampide, while the latter one to Istmide.

The lower wing of the third group, also not very compact, consists of the series of Miwok, Creek and Sioux showing medium to high stature (166–172), meso-brachycephaly (79–89), short to medium long face (81–85) and medium broad to broad nose (69–78). Consequently, the centre and lower wing of the third diagraphic group should be attributed to Imbelloni's Kolumbide and Planide.

Next comes the fourth group embracing Yuki, Rarascans, Zotzil, Zendal, Maidu, Otomi and Triques, i.e. Californian and Northern Mexican series, characterised by low stature (156–161), dolichomesocephaly (76–81), short face (78–83) and very broad nose (83–87). They could represent very well Imbelloni's Sonoride, if not having too low stature. But, we suspect that Imbelloni errors when he attributes high stature to Sonoride, since most of the Northern Mexican tribes are low statured. Again typologically speaking, these populations seem to be strongly influenced by an archaic prevalence of the Ainuid component.[8]

The isolated position of Pomo was caused by their tendencies towards higher stature (164), combined with mesocephaly (80), short face (79) and very broad nose (91), what suggests Mongoloid admixture.

The fourth group passes smoothly into the fifth one which comprises Aztecs, Zapotecs, Zoke, Yamama, Chontal, Huastecs, Totonacs, Maya and Tsimshians. They show low to medium stature (155–167), meso-brachycephaly (78–86), very short face (77–83) and broad nose (77–80). The upper centre is related to Sonoride

[7] J. A. Vellard: Contribution à l'etude des Indiens Uru ou Kot'suns, "Travaux de l'Institut Français Andines", Paris–Lima 1951.

[8] A. Wierciński: Interpopulational differentiation of the living Amerindian tribes in Mexico, "Światowit", Vol. 34, 1975

while the lower one suggests typical Totonaco–Mayan complex, i.e. strong Lapponoid strain. We deal here again with Istmide of Imbelloni. The position of Yamama in the Istmide group disagrees with Imbelloni's concept, who assigns them to Fuegide (rather owing to geographic reasons than their morphology?). The same regards the position of Tsimshians. In the light of individual typology, both these populations simply reflect varying proportions of the Ainuid component.

Then follows the sixth group consisting of Bolivian Quechua and Aymara–Colla and Salish, being though Quechua related to the previous Mexican group. They are characterised by low stature (158–160), meso-brachycephaly (81–89), very short face (76) and moderately broad nose (71–73). The position of the Salish series in this group is difficult to explain and seems to be illogical, while the type of both Bolivian series, being near to Quechua from Titicaca region, supports the hypothesis of Imbelloni that we may deal here with Andide based on Lagide background.

At last, the contents of the seventh group of the diagram should he described. It shows a more dispersed structure and includes mainly the rest of Southern Amerindians, i.e. Carajas, Bororo, Maca, Mataco, Nambicuare, Bacairi, Chiriguano, Chorote, Camaiura, Mono, Botocudos and Caiapo. The upper wing yields series with higher stature (169–174), dolicho-mesocephaly (75–81), variable face (82–89) and very broad nose (86–87) while the centre shows mesocephaly (78–80), rather long face (86–91) and also very broad nose (79–86) combined with lower stature (161–172). Thus the upper wing is shifted towards Pampide-Amazonide and the centre comprises variation between Amazonide and Lagide. However, Mono much better reflect the Lagide complex of traits than any other series of the seventh group, being dolichocephalic, short faced and broad nosed. The Caiapo in their morphology are more Amazonide–Kolumbide, since they show relatively high stature (168), brachycephaly (85), with short face (83) and very broad nose (83).

In this way, the Diagram VI of average populational morphotypes, in spite of a scarcity of traits, revealed unexpectedly very logical net of relationships between the analysed Amerindian populations what is almost in complete accordance with the classifications of v. Eickstedt and Imbelloni, based on the concept of geographic races. Of course, a more detailed division could be obtained, if more diagnostic physiognomic features would be simultaneously considered in multivariate analysis.

In any case, the populations from Peru and adjacent regions appeared to be far from homogeneity of one geographic Pueblo–Andide race!

The comparison of available series from Biasutti's book, presented in the Table 2 clearly demonstrates this statement.

Table 3 shows division into 5 distinct complexes of traits realised by:

1. Quechua from Peru, characterised by low stature, mesocephaly, extremely long face and only moderately broad nose;

2. Uru and Chipaya, with also low stature but definitely dolichocephalic with long to very long face and medium broad nose;

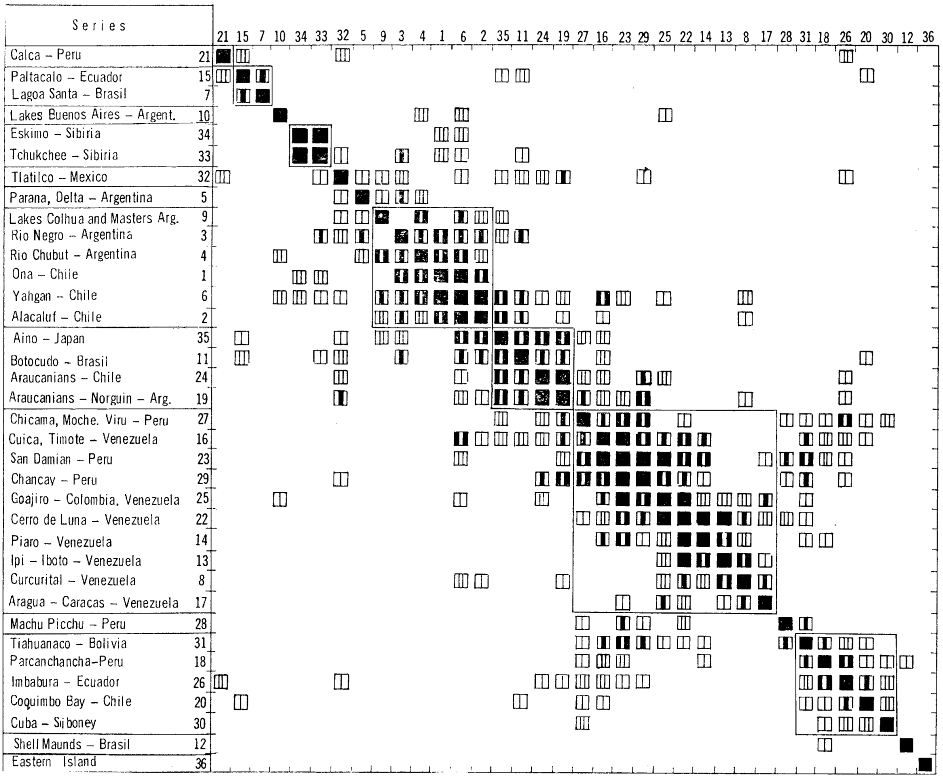


Figure 6: The diagram VII of successive distances (DD^2) of Czekanowski – craniological craniological series from South America.

Table 5: Mean characteristic of racial elements. Remark: The resemblance to definitions of some racial elements were added and calculated according to aproximation method of A. Wanke (see: Wierciński, 1975).

Racial elements	Traits			
	Stature	Cephalic index	Face index	Nose index
P – Ainuid	157	72.5	80.5	81.0
L – Laponoid	158	84.5	79.0	78.0
Z – Pacyfid	172	80.0	92.0	66.5
M – Mongoloid	173	92.5	79.0	76.5
I – Arctic	158	72.5	90.0	64.0

3. Uru–Aymara, resembling Quechua from Peru but shifted towards high stature, more pronounced mesocephaly at the limit of brachycephaly, shorter face and medium broad nose;

4. Quechuanised population from Titicaca region, sharply distinguished by their strong brachycephaly combined with low stature, very long face and almost narrow nose;

5. Quechua and Colla from Bolivia, clearly cut out by mesocephaly, associated with definitely broad face, broad nose and low stature.

It seems that Uru–Aymara type (3), owing to its central morphological position, may be interpreted as an effect of a blending process between proper Quechua from Peru (2.1) and "Quechuanised" population from Titicaca region (2.4). In this case, the latter population could serve as a model for proper Aymara brachycephalic type and, consequently, the heterogeneity of Peruvian Amerindians would reflect, at least, the division into 4 main regional average morphotypes:

1. Peruvian Quechua of typical Altoplanide complex,

2. Aymaran of Andide–Istmide (?) affinities,

3. Uru–Chipayan of pure Fuegide, i.e. Paleoeskimide affinities and,

4. Bolivian Aymara of Istmide–Lagide affinities.

However, these regional morphotypes of the living concern only recent times and they cover merely small area of Peru. Therefore, our taxonomic considerations must be extended in time and space, what is possible on the basis of craniological materials.

The analysis of craniometric data

The material of average craniological types was taken from the synthetic publication of T. D. Stewart and M. T. Newman[9] and completed for elucidatory purposes by the data of Koganei[10], W. W. Ginzburg[11], R. I. Murrill[12], A. Posnansky[13] and M. G. Levin[14]. There were considered 9 classic diameters (only for male crania): g–op, eu–eu, b–ba, n–pr, zy–zy, n–ns, nasal breadth, orbital height

[9] T.D. Stewart and M.T. Newman: Anthropometry of South American, Handbook of South American Indians. Smithsonian Institution, Washington 1950, Bulletin 143, p. 19–52.

[10] Koganei: Beiträge zur physichen Antropologie ser Aino, Vol. 1, 1893, Verlag der Universität Tokio.

[11] V.V. Ginzburg: Antropologicheskaya charakteristika drievnych aborigenov Kuby, "Nauka", Leningrad, 1967, (kultura i byt narodov Ameriki), p. 180–278.

[12] R. I. Murrill: A study of cranial and postcranial material from Easter Island. Easter Island and the East Pacific, Reports of the Norwegian Archeological Expedition, Vol. 2, Stockholm 1965, p. 255–343.

[13] A. Posnansky: Eine prahistorische Metropole in Südamerika, Vol. 1, Berlin 1914.

[14] M. G. Levin: Kraniologicheskiye tipy Tchukchey i Eskimosov, "Sbornik Muzeya Antropologyi i Etnografyi", Vol. 10, Moskva–Leningrad 1949, p. 293–302.

and d–ek, as well as 5 indices (calculated for both sexes): cranial, mean height, upper facial, nasal and orbital.

All these metric traits were simply normalysed by dividing them by mean intrapopulational standard deviations, published by Stewart and Newman. Then, the matrix of DD^2, T. Henzel's distances was calculated which served as the basis for construction the symmetrical Diagram VII of successive Czekanowski's differences. All the calculations were computerised according to the programme formulated by A. Góralski.

The Diagram VII (Fig. 6) demonstrated division into 4 larger groupings, more or less related to each other, some smaller groups and the more isolated series. This clustering, in general, seems to be less structuralised than the Diagram VI. Perhaps, it is due to too great number of traits considered which could be reasonably decreased only to indices and modules of neuro- and splanchnocranium eventually with addition of bizygomatic diameter. However, the present author wanted to advantage all the available craniometric information in multivariate analysis.

A first glance at the diagram awakes some wonder! Namely, why there is a lack of truly brachycephalic series? If this is the result of the prevalence of the representatives of the past populations, so, is it possible that some southern Ameridians underwent the process of brachycephalisation? This question, for the time being must be left without reply.

The description of the Diagram VII, complemented by the mean characteristics of its groupings (Table 6), may start with the first larger cluster consisting of 3 Argentinian series and 3 from Southern Chile, i.e.: Ona, Yahgan and Alacaluf. They are characterised averagely by biggest dimensions of neurocranium, large bizygomatic diameter, dolichocephaly, medium low cranial vault, medium long face and nose and moderately high orbits. Thus, this third group of the diagram comprises Pampide merged into Fuegide. The series from the Delta of Parana belongs, in fact, to the same complex differing only by tendency towards higher vault, longer face and higher orbits. The series from the Lakes of Buenos Aires, being more isolated though also related to Fuegide–Pampide group, is shifted towards mesocephaly and strong lowering of the cranial vault. It may suggest a connection with Venezuelan Istmide which appear in the lower centre of the fifth group. Furthermore, it should be firmly emphasized that very compact Asiatic Eskimo–Tchukchee group shows relationships with the third, Fuegide–Pampide group, while Ainu from Japan occupied a transitional position between Yahgan and Alacaluf, on one hand, and the Botocudos with Araucanians, on the other. The latter series reveal far smaller neurocranium, mesocephaly, medium high cranial vault and face, relatively low orbits and medium broad nose. Perhaps, this fourth group of the diagram represents Pampide modified by Andide and Amazonide.

Moving upwards, we meet the group I which includes the famous series from Lagoa Santa and Paltalcalo from Ecuador. They show moderate cranial dimensions, strong dolichocephaly, medium low vault, short face, medium high orbits – and broad nose, i.e. the classic complex of Lagide characteristics. The more isolated series of Calca from nothern Peru demonstrates clearly similar set of traits, being only shifted towards lesser dolichocephaly, higher vault and higher

Table 6: Mean characteristics of diagraphic groups.

Trait	Diagraphic group								
	Group I Lagide	Lake Buenos Aires Fuegide – Istmide	Parania Delta Argentine Fuegide – Pampide	Group III Pampide – Fuegide	Group IV Andide – Pampide	Group V Upper Centre Andide – Istmide	Group V Lower Centre Istmide – Amazonide	Group VI Andide – Lagide	Shell Mound Brasil
g – op	183.6	183.7	186.2	188.1	179.5	176.9	181.5	175.9	182.8
eu – eu	131.2	148.7	142.7	142.5	140.2	140.3	142.1	136.6	135.0
b – ba	135.5	131.5	146.9	139.0	137.7	132.4	129.4	136.1	140.0
n – pr	65.4	77.6	76.7	74.3	72.2	71.3	–	67.1	–
zy – zy	135.1	146.7	144.6	143.7	136.4	136.0	134.0	131.4	139.5
n – ns	49.9	52.8	55.8	53.4	52.1	50.3	52.6	49.3	54.2
Nasal breadth	24.9	25.6	26.1	25.3	25.0	23.9	25.9	24.0	23.0
Orbital height	33.9	34.6	36.4	35.8	35.0	34.5	35.8	34.7	34.6
d – ek	39.5	38.6	40.6	39.9	41.5	38.9	38.6	38.1	36.8
Cranial index	71.1	80.9	76.5	76.3	78.6	79.9	79.3	78.1	75.7
Mean hight index	85.9	79.8	88.8	84.2	86.2	83.1	79.5	86.1	89.2
Upper face index	48.7	52.6	54.9	52.3	52.6	50.1	–	51.9	–
Nasal index	50.5	47.8	47.5	47.9	47.9	48.7	49.7	49.1	44.7
Orbital index	86.7	91.6	91.1	89.6	85.0	89.1	93.1	92.0	94.0

orbits. Thus, it may be surely assigned to Andide–Lagide, with a prevalence of the latter.

The largest, fifth group of the diagram consists of two centres. The upper centre embraces Peruvian series from Chicama, Moche, Viru, San Damian and Chancay, as well as two Venezuelan series of Cuica–Timote and Goajiro. They are strongly mesocephalic at the upper limit of this category, with small cranium, medium low vault, rather short face, medium broad nose and high orbits. This complex of traits seems to correspond to Istmide–Andide affinities, perhaps, with some possible Amazonide influence. The Istmide prevail in Chicama, Moche and Viru series, while, in San Damian and Chancay some more Andide influence may be suspected. The lower centre of the fifth group includes exclusively Venezuelan series of Cerro de Luna, Piaro, Ipi-Iboto, Curcurital and Aragua. They are characterised by somewhat bigger cranium and definitely lower cranial vault, mesocephaly, broader nose and very high orbits. We deal here probably with Istmide–Amazonide combination. At last, it comes the sixth group of a less compact structure, which includes the series from Tiahuanaco, Parcancancha, Imbabura from Ecuador and, from Coquimbo Ray, Chile. Siboney from Cuba also show some relationship with this group. The series from Machu Picchu and Brasilian Shell Mounds are bound with this group too.

In general, the sixth group is characterised by definitely small neurocranium with medium high vault, mesocephaly, not very long face, medium broad nose and very high orbits. It should be noticed that the series from Parcancancha and Coquimbo Bay are shifted towards dolichocephaly. However, the first one shows shortening of the face with broad nose and very high orbits, what affiliates it to Lagide–Andide, while the second series should be rather assigned to Andide–Fuegide owing to its longer face and narrower nose.

The series from Machu Picchu is distinguished by stronger mesocephaly, lower vault, shorter face, higher orbits and broader nose. Thus, it corresponds more to Andide–Amazonide than to Andide–Lagide.

The series from ancient Tiahuanaco, published by Posnansky seems to occupy an intermediate position between Quechua and Uru types and, so, it may be assigned to Andide–Fuegide. The series from the Shell Mounds in Brasil, are distinguished by the extreme combination of dolichocephaly, high cranial vault, very high orbits and definitely narrow nose what, perhaps, is the extreme representation of Fuegide, or Fuegide–Lagide (?).

The series from Eastern Island, which has been introduced into the diagram in order to verify its possible connection with ancient Peru occupied completely isolated position. It shows extreme dolichocephaly and moderate cranial dimensions, high cranial vault, medium long face, high orbits and broad nose. Consequently, the average populational craniotype of the ancient inhabitants of the Easter Island has nothing in common with any southern Amerindian population.

In conclusion, the logical structure of relationships between the studied average cranial types of Southern Amerindians together with a general correspondence with Imbelloni's classification should be emphasized. Fortunately, the gaps in taxonomical knowledge of the coastal ancient Peru have been also filled up.

Conclusions

The multivariate taxonomic analysis of various chrono–territorial Peruvian populations, carried out in this paper and based on wide interpopulational comparisons in serological, epigenetic and traditional anthropo- and craniometric characteristcs permits to infer the following conclusions:

1. the serological and epigenetic characteristics did not bring any reasonable taxonomy and, in their light, the Peruvian Quechua and Aymara are almost indistinguishable from each other,

2. the comparison in epigenetic traits demonstrated great differences between Peru and remaining Amerindians and their lack in reference to Peru and Punjab, what should be regarded as sheer taxonomic nonsense,

3. the comparison of average populational morphotypes in two sets of anthropo- and craniometric traits showed good agreement with v. Eickstedt–Imbelloni classification of geographic races as well as, it made possible to reveal distinct racial differentiation of Peru and adjacent regions, that is:

    - the coastal area was peopled by the populations of Lagide and Andide–Istmide affinities;
    - the mountaineous area shows division into various regional types of proper Quechua assigned to Andide, Aymara to Andide – Istmide, Uru – Chipaya – to Fuegide and Bolivian Ayamara and Quechua of Andide – Lagide and Istmide – Lagide affinities

4. from the distribution of the established interpopulational relations between the studied morphotypes, it might be hypothetically concluded that:

    - the most archaic background preserved in Titicaca region consisted of Fuegide, perhaps, of Paleoeskimide affinities; also, a very ancient migration of Lagide, going from the North, bifurcated in Ecuador and peopled coastal area on one hand, as well as, it penetrated from the Bolivia the Andean region, on the other,
    - then it came the wave of Istmide, going through Venezuela and reaching Bolivia and Peru;
    - the Andide of the classic Quechua type seem to represent simply Fuegide–Istmide affinities while the Aymara morphotype displays Istmide–Lagide affinities.

However, the approach of the concept of geographic races may serve only as a first, rough approximation to taxonomic reality.

Thus, the present author sees further perspectives of research merely in the applications of the methods of the Polish Anthropological School, with its very

Table 7: The comparison of serological distributions for Uru, Aymara and Quechua from Peru (in %)

Series	Blood group										
	A	B	AB	0	R^0	R^1	R^2	R^Z	M	MN	K
Prevalently Uru	1	1	—	98	5	42	44	6	46	46	—
Aymara (Titicaca)	5	2	—	93	4	43	42	5	41	46	2
Aymara (previous)	—	—	—	100	—	49	47	4	43	40	—
Quechua–Peru (previous)	3	5	—	92	15	34	38	13	55	40	—

refined individual typology, to possibly large and well dated craniological material from Peru, Ecuador and Bolivia. In this case, a new and detailed taxonomical information may be obtained which, together with archaeological, linguistic and ethnohistorical data, could create a safe basis for synthetic study of ethnogenesis of Peru.

Addendum

Unfortunately, just now after completing this paper, the present author has received the serological data published by E. Carles-Trochain[15] for another Aymara and prevalently Uru groups from the region of Titicaca. They are presented in the Table 7, together with the previously studied series in this paper from Peru.

As it may be easily seen, the comparison of serological distributions did not bring any change of our general conclusions. It is so, because the data in the Table 7 show the same far greater degree of serological homogeneity of the examined Peruvian groups than their average morphotypes do. Moreover, quite taxonomically distinct Uru in their morphotype, appeared to be serologically very similar to Aymara. Of course, we keep in mind here only the criterion of taxonomic relative similarity and not the question of statistical significance of differences estimated, for example, by Chi-square testing.

(Reprint from: "Wiadomości Archeologiczne", 1975, vol. 40, pp. 441–456)

[15]E. Carles-Trochain: *Etude hemotypologique des pecheurs du lac Titicaca*. Hermann, Paris, 1968.