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INDIVIDUAL TYPOLOGY AND THE INTRASPECIFIC TAXONOMY OF MAN

SOME THEORETICAL PREMISES

Taxonomy as a science deals with the principles and methods of classification and ordering of the living systems. It demands clear defining:

- a) of the objects of a departure material for classification,
- b) of the choice of diagnostic traits and the evaluation of their diagnostic weights,
- c) of the taxonomical procedures and aims of their application and,
- d) of the methods of the description of distinguished taxonomic units and the establishing of their systematic ranks.

Also, criteria of intragroup homogeneity versus intergroup heterogeneity should be precised.

The intraspecific anthropological taxonomy aims to distinguish and to describe the natural units of differentiation of the recent man in a set of hereditary characteristics in order to conceive the processes of microevolution and hybridization. Of course, both of these processes are intertwined with each other.

The human individuals are the elementary objects which partake in both these processes.

They may be grouped in very different ways according to innumerable structural (molecular, micro- or macromorphological) and functional (physiological, psychological or behavioral) characteristics.

These characteristics are heritable but, to a different degree, eco-sensitive (i.e. modified by direct influences of the environmental factors).

Some of these characteristics which determine individual interactions in the reproduction process are responsible for the formation of human breeding groups, i.e. the breeding populations. The latter ones should be distinguished from the geographic populations which are defined by arbitrarily selected habitation areas.

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 in heritable phenotypical and genotypical characteristics	Appreciation of taxonomical differentiation of individuals irrespective their populational descent in a set of heritable phenotypical or genotypical characteristics
2. Primary objects of the departure material for classification	Breeding populations	Individuals
3. Criteria of distinguishing primary objects	Ill-defined isolating barriers of breeding 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. Criteria of intragroup homogeneity	Testing of statistical representativeness of samples derived from a general population and random distribution of individual characteristics	Relative similarity of individuals greater than intertype differences
6. Degree of intragroup variability	Usually great, greater than interpopulational variability	Small, usually narrower than the 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 blocks, genetic linkages

It is so, because boundaries of breeding populations must not necessarily overlap with boundaries of the geographic ones since, members of the latter may belong to various breeding groups (for example, the geographic population of Pommerania could belong to the German or Polish populations).

The following criteria of intergroup homogeneity are in use in contemporary taxonomy of man:

1.1 — the relative similarity (with identity as a limiting case) which is measured by a taxonomic distance (otherwise called: biological distance); most frequently this distance is subjectively appreciated or determined by means of a formal concept (for instance, DD of Czekanowski, $(DD)^2$ of Henzel, D^2 of Mahalanobis, C_h^2 of Penrose Δg of Hiernaux etc.); the individuals or populations grouped by use of the criterion of relative similarity represent formally the plac-

es of concentrations of points (clusters) in multidimensional space of m traits;

1.2 — the testing of statistical representativeness of samples derived from the various areas of a given general population;

1.3 — the testing of randomness of distributions of single traits or sets of traits within a given human group, in the sense of Gaussian distribution or, for a set of traits, by demonstrating a lack of linear or multiple stochastic correlations which could be responsible for intra-group effects of clustering in a number of taxonomic traits which formally would represent the places of significant surpluses in multidimensional space of m traits.

All these criteria may overlap to a different degree. Under the term: "anthropological taxonomical characteristics" should be understood values of any structural or functional variable which make possible to follow the course of hybridization, microevolution or evolution (the latter at the interspecific level).

Consequently, only genotypical characteristics or highly heritable and possibly least ecosensitive phenotypical traits ought to be considered here.

Unfortunately, contemporary anthropology is entangled in vivid issues due to a lack of clear-cut notions, terminological misunderstandings and some non-scientific factors. The issues are carried out by the adherents of different concepts of human races.

At present, the following concepts of race may be distinguished:

2.1 — the concept of geographic races which recognizes 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 (the g. race may be homogeneous according to all 3 criteria);

2.2 — the populationistic concept which makes equivalent the notion of the race with the notion of breeding population (usually, an ethnic, administrative-political or a social unit — with application of criteria 1.2 and 1.3) or, with a group of breeding populations similar to each other in their allelotypical or heritable phenotypical characteristics (criterion 1.1);

2.3 — the concept of racial clines which rejects the notion of the race as a real biological entity and deals only with regularities in the spatial distributions of single geno- or phenotypical characteristics of the regional human groups;

2.4 — the concept of individual races (individual typology) which utilizes the notion of the racial type to denote a group of human individuals irrespective their populational descent and resembling each other in a whole complex of racial traits (criterion 1.1).

It is easy to notice that the departure material for classification in the frame of the first three concepts consists of collective objects (the

level of populational variability) while the last concept begins with single objects (the level of individual variability).

It seems that all these four approaches to human raciology are mutually complementary and yield information of their own.

However, since the notion of race is used in different meanings and 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 can never be equivalent in their taxonomic contents.

In order to show 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.

It is worthy of emphasis that adherents of the concepts 2.1 - 2.3 agree in advancing some severe criticism against the concept of individual races*.

Their objections may be summarized briefly as follows:

3.1 — the individual typology arose in the "pregenetic" phase of biology, and, so it does not take into account the contemporary population genetics; therefore, it deals with the Platonic notion of type;

3.2 — actually, there is an independent, random sorting of a great number of genes and the process of crossing over (which disunites the genetic linkages); both these processes assure the intrapopulational homogeneity in the sense of criterion 1.3, as well as, a genotypical uniqueness of individuals;

3.3 — an elementary unit of evolution is a breeding population gene pool which is subject to evolutionary forces such as mutations, natural selection, genetic drift, isolation etc. but, not the individuals;

3.4 — theoretically, existence of a greater number of genes should be assumed of which effects can not be phenotypically detected and, consequently, the individuals phenotypically resembling each other but derived from different populations, may profoundly differ genotypically from each other;

3.5 — the individual typology utilizes the old fashioned, indiscrete morphological characteristics which are rather useless in taxonomy since their polygenic mode of inheritance is unknown and, they show a high degree of ecosensitvity; on the contrary, simple monogenic and phenotypically discrete characteristics should be used such, for instance, as the blood groups, PTC-test, epigenetic traits etc.;

* see for example an extensive discussion following review articles by A. Wierciński and T. Bielicki in *Current Anthropology*, 1962, vol. 3; participants: Abbie, Bielicki, Boyd, Bunak, Cipriani, Coon, Dobzhansky, Gann, Hiernaux, Givens, Hunt, Lasker, Michalski, Mourant, Oschinsky, Wierciński.

3.6 — the individual typology is not able to follow the dynamic processes of microevolution (and so, those of rasogenesis) because it deals with static (*ex definitione*) taxonomic units;

3.7 — due to all these objections, the individual races or racial types are only morphostatistical artefacts which are biologically unreal.

The purpose of this paper is to demonstrate that all these objections refer to all the raciological concepts and, that individual typology of the Polish Anthropological School may be successfully applied to follow processes of hybridization and microevolution.

DISCUSSION OF OBJECTIONS 3.1 - 3.7

Ad. 3.1 ("pregenetic phase" and Platonic types)

1). The individual concept of race, at least, that formulated by J. Czekanowski, emerged precisely from mendelism since it was based:

- a) on the assumption of pleiotropy for the whole complex of typological traits, and
- b) on the application of Hardy-Weinberg law for calculating the intrapopulation distribution of elementary types (=so called: racial elements) according to the equation:

$$(a_1 + a_2 + \dots + a_x)^2 = 1$$

where: a_x — relative frequency of the racial element x and $a_1 + a_2 + \dots + a_x = 1$.

If so, it is only possible to say that the theoretical foundations of i. typology (some 50 years ago!) were oversimplified in reference to the present knowledge of human genetics what has been assessed by the same typologists [Wierciński 1958 and 1962].

2). On the contrary, just all the other concepts of race 2.1 - 2.3 have been inrooted in the "pregenetic" XIX-th century science since we know that anthropologists of this time began to study geographic gradients in single racial traits and to look for their areas of overlapping (recall the emergence of classifications of Ripley, Deniker, Tchepourkovsky, Biassutti and many others).

Also precisely this "pregenetic" century is characterised by the appearance of ethno-population races which were based on the assumption of homogenising effects of the breeding process which was thought to lead towards blending of primarily distinct racial components. This process of blending was imagined in an indiscrete way, something like a diffusion of liquids ("blood mixing", "Blood Theory").

At the same time, individual variability within such population races has been recognised and appreciated in the form of regional gradients or frequency distributions of single traits. Then, what is the essent-

ial difference between populational races of the "pregenetic" phase and those of contemporary populationistic concept?

Perhaps, it is only that the previous vision of a diffusion of liquids has been replaced by a vision of discrete particles of a "gene-gas", mixing at random... It might be said that the Blood Theory simply passed into its "gaseous state".

3). As regards the question of a Platonic sense (raised by Dobzhansky) lurking for a poor scientist in the blind alley of the type concept, first of all, the notion of the type should be precised. This may be done in the following way: the racial type is any combination of a set of taxonomic traits which is expressed alternatively in the form of intervals (categories) of indiscretely varying characters or, in the form of connotations of any alternative code for the discrete features, which is realised by any group or a set of groups of human individuals, distinguished according to the criterion of relative similarity.

If so, we may speak about populational types i.e. sets of average characteristics of populations relatively similar to each other (or, *horrible dictu*, their allelotypes) and about the individual racial types as well, since the procedure of appreciating taxonomic distances is logically equivalent in both cases.

Why this meaning of the type must necessarily lead to the Platonic philosophy? Surely, it must not!

The Platonic notion of the type refers equally well to the individual taxonomists as to the populationistic ones of various breeds, if anyone of them assumes a real existence of the separate world of Platonic ideas of which pale and variable reflections are both the individual types and populational races or, only the racial clines. Moreover, even the reproduction process which is organising a given breeding population may be a reflection of the suitable Platonic idea in the eternal and immutable space of *Logos*.

Personally, the present author knows nobody out of the adherents of individual typology as the believer in Platon's system.

But it seems that if we must choose among the ancient philosophical systems, the typological concepts will be near to Aristotle while the populationistic one with its random sorting of discrete genes corresponds simply to the atomistic and mechanistic materialism of Carvaka or Democrite.

However, the same Dobzhansky prefers to confess that the philosophical roots of populationistic concept are embedded in the Judeo-Christian ideology which emphasizes the uniqueness of the human soul...

Ad 3.2 (random sorting of genes, randomizing effects of crossingover and individual uniqueness)

Table 2. Two examples of the homogeneity of the racial elements from Poland versus intrapopulation heterogeneity

Nordic element (N=195)							Laponoid element (N=169)						
Cephalic index	Face index	Nose index	Empirical frequency	Theoretical frequency	Surplus	Component of χ^2	Cephalic index	Face index	Nose index	Empirical frequency	Theoretical frequency	Surplus	Component of χ^2
A	B	C	n	n'	(n-n')	$\frac{(n-n')^2}{n'}$	A	B	C	n	n'	(n-n')	$\frac{(n-n')^2}{n'}$
1	1	1	11	9,1	+1,9	0,40	1	1	1	37	32,5	+4,5	0,62
1	1	2	14	11,5	+2,5	0,54	1	1	2	19	24,7	-5,7	1,31
1	2	1	16	16,9	-0,9	0,05	1	2	1	17	20,9	-3,9	0,37
2	1	1	23	20,9	+2,1	0,21	2	1	1	26	26,0	0,0	-
1	2	2	18	21,5	-3,5	0,57	1	2	2	21	15,9	+5,1	1,64
2	1	2	20	26,5	-6,5	1,59	2	1	2	21	19,7	+1,3	0,09
2	2	1	36	39,1	-3,1	0,25	2	2	1	16	16,6	-0,6	0,02
2	2	2	57	49,5	+7,5	1,14	2	2	2	12	12,7	-0,7	0,04
			$\chi^2_{ABC} = 4,75$	$P > 0,30$							$\chi^2_{ABC} = 4,45$	$P > 0,30$	
			$\chi^2_{AB} = 2,07$	$P > 0,10$							$\chi^2_{AB} = 0,18$	$P > 0,50$	
			$\chi^2_{AC} = 0,10$	$P > 0,70$							$\chi^2_{AC} = 0,04$	$P > 0,80$	
			$\chi^2_{BC} = 1,45$	$P > 0,20$							$\chi^2_{BC} = 2,05$	$P > 0,10$	

Remarks: At the same time, the values of χ^2 for the small regional population from Rybnik are usually significant for the same traits:

$\chi^2_{ABC} = 338,23$, $P < 0,001$; $\chi^2_{AB} = 57,40$, $P < 0,001$
 $\chi^2_{AC} = 1,20$, $P > 0,20$ and $\chi^2_{BC} = 279,58$, $P < 0,001$

1). All the applications of multiple stochastic correlation method (Wanke-Lancaster method) for the classic taxonomic traits (cephalic or craniometric indices, cranioscopic characters, stature and pigmentation traits) showed invariably the intrapopulational heterogeneity in the sense of criterion 1.3, even within a small regional panmictic population of Rybnik or Tarnowskie Góry, Poland. Here, it should be emphasized that the places of significant surpluses appeared just for these combinations of categories of traits which characterise the racial elements of the Polish Anthropological School or the most frequent intermediate type (in this case, the Subnordic type in Poland) which is, perhaps, subjected to a positive selection [Wanke 1952, 1953 and 1964, Szczotka 1959, Waliszko 1966, Wierciński 1967, Wiercińska 1965]. Furthermore, it appeared that significantly non-random distributions persisted in various combinations of traits, even after removing the power of interactions within them.

Contrary to populations, the racial elements seem to display homogeneity in the sense of criterion 1.3.

Unfortunately, only two larger samples of individuals assigned by Michalski [1949] to different elements from Poland (i.e. Nordic and Laponoid) could be analysed by use of Wanke-Lancaster method in reference to cephalic, facial and nasal indices (table 2).

It is easy to see that there is a complete lack of significant associations in all possible combinations of the categories of these three characters.

2). The studies on inheritance of typological affinities (established by use of differential diagnosis of Michalski and reference points method of Wanke) on the basis of the material of families from Poland, Kisar and Rehoboth [Wierciński 1958] allowed to draw following conclusions:

- a) parents who belong to one and the same racial element produce offspring also showing the same racial affinities;
- b) offspring descending from the parents of intermediate types reveal only logical recombinations of the components to which parents have been assigned.

This result seems to contradict the assumption of random sorting of genes which determine a set of traditional racial traits, both indicial and the scopic ones. However, the empirical fact of some kind of an associated inheritance can be also demonstrated without any typology of the families. The two examples (Polish families) presented in the table 3 may suffice as an illustration. Thus the cross-comparisons of the cephalic index of adult offspring in reference to categories of the nasal index of their parents and the eye colour of the former to cephalic index of the latter, show clearly non-random distributions and highly significant surpluses in the places of extreme categories of traits of the

Table 3. Two examples of associated inheritance of uncorrelated traits in general population

Nasal index of parents: mother/father	Cephalic index of offspring			Cephalic index of parents: mother/father	Eye colour of offspring		
	$x - 82,9$	$83 - x$	n_x		13 - 16	1 - 12	n_x
$x - 65,9/x - 65,9$	117 +19.4 97.6 3.86	116 -19.4 135.4 2.78	233	$x - 82,9/x - 82,9$	118 +18.6 99.4 3.48	128 -18.6 146.6 2.36	246
$x - 65,9/66,0 - x$	106 -15.1 121.1 1.88	183 +15.1 167.9 1.36	289	$x - 82,9/83,0 - x$	116 -12.9 128.9 1.29	203 +12.9 190.1 0.88	319
$66,0 - x/66,0 - x$	41 -4.4 45.3 0.41	67 +4.3 62.7 0.29	108	$83,0 - x/83,0 - x$	27 -5.7 32.7 1.00	54 +5.7 48.3 0.68	81
n_y	264	366	630	n_y	261	385	646
	$\chi^2 = 10.58$	$P < 0.01$			$\chi^2 = 9.69$	$P < 0.01$	

Interparental r of C.I. = -0,028; interparental r of N.I. = +0,136

interparental r of E.C. = +0,038; general population r of C.I.xN.I. = 0,015

general population r_p of C.I.xE.C. = +0,060

The material consists of 290 families from Pułtusk Distr., Poland, anthropometrically investigated by B. Rosiński [1918 - 25]; the second comparison was taken from Wiercińska [1972].

parents. Furthermore, it should be noticed that this result can be neither the effect of correlations between all these traits in the general population, because the coefficients insignificantly differ from zero, nor the assortative mating of the parents for the same reason.

Thus, how to explain the findings of such an associative inheritance of the undoubtedly polygenic traits?

A theoretical answer may be found in the following quotations from the excellent book of Lerner [1958] dealing with the theory of natural selection:

„Polygenes tend to occur in balanced systems, the polygenic blocks being of particular significance in this connection” ... “Contrary to many interpretations of polygenic inheritance (including that in the original formulation of this concept), polygenes have pleiotropic effects and can act both as modifiers or suppressors of other genes and systems or as determinants of variations of traits for which no major gene differences are demonstrable” (p. 38).

“In terms of a few generations at a time, such blocks may act as single segregating units or as units of physiological function. Selection may operate directly to maintain such blocks intact or may promote various devices, including tighter linkage, inversions and any other mechanism for reaching crossing-over non-random, for the same purpose” (p. 37).

From all these statements emerges a picture of gene pool of human population as a real organised system which is not governed by simplistic rule of random sorting of the genetic material but, where is some place for reasonable description in terms of individual typology.

3). Now, we have to consider the question of individual uniqueness so firmly emphasized by Dobzhansky.

First of all, it is worthy of mention that: if individuals can not be grouped into types within any population since they are the possessors of unique genotypes, the more the populations can not be grouped into populational races since their gene pools are far more complex systems. In other words, the uniqueness of individuals must necessarily lead to a far greater uniqueness of populations.

However, all breeds of taxonomists do not bother about the uniqueness of individuals (or populations) and classify them freely as they want. It is so, because individuals (and populations) have a lot of genes in common (for example, the species-specific ones), in some of them they are more variable (for example, in blood groups) and yet there are some by which they seem to be unique beings (for example, the finger patterns used in criminology). Actually, we know after studies on homologies in sequences of polynucleotids of DNA carried out by the Division of Biophysics of Carnegie Institution (1963 - 64) that:

a) on ca. 3.5×10^9 pairs of nucleotids within the genome of a mammal,

about 75% is common in the frame of superfamily, 50% within suborder and 25% among the members of the same order;

b) chimpanzee and man have over 95% of pairs in common.

The latter result has been fully confirmed by the serochemical distances investigated by Goodman [1968].

Thus, less than 5% of the genetic material remains for inter and intraspecific differentiation of human individuals.

Ad 3.3 (question of elementary unit of evolution)

1). In fact, individuals, inbred lines and total breeding populations, as well as, the ecosystems and biosphere in its wholeness are subject to evolutionary forces.

It suffices to show that individuals, and not populations, are carriers of mutations and interact in the reproduction process. Also, through ontogeny of individual phenotypes acts natural selection.

However, at the same time, the course of evolution depends not only on individual characteristics but also, on the characteristics of the population as the whole (on its size or degree of isolation to cite the simplest examples).

In general, any organised system evolves because its components change and its components change because the system evolves. There are evident feedbacks between changes of components and changes of the system as a whole, if the system is a real organised system. Looking for elementary units of evolution is a reminiscence of XIX-th century reductionism...

Ad 3.4 (hidden genes without visible phenotypical effects)

1). This objection may be dealt with in a very simple way, namely: if it is forbidden to classify human individuals because of the existence of such cryptogenes, so it should be forbidden to classify populations, for the same reason. The possible evasion from this hard obstacle seems to be only one: if a taxonomist must rely upon hereditary phenotypical characteristics, he should deal with a good number of them in order to make more probable the genetic proximity of the elements assigned to a given taxonomic unit.

Ad. 3.5 (monogenic traits versus traditional racial characteristics)

1). There is possible to quote from different publications a lot of examples which demonstrate clearly that the various serological characteristics (of simple mode of inheritance) are not very useful in appreciating relationship between people [Oschinsky 1959, Ginzburg 1963, Wierciński 1966]. Especially the multivariate diagraphic analysis of larger material of Amerindian tribes, characterised by ABO, MNS, RH, Kell and Duffy systems, fully corroborates this statement [Wierciński 1975]. Namely, obtained clustering appeared

to be incompatible with ethnolinguistic and spatial distributions of the tribes, as well as, with their evident racial physiognomy.

Furthermore, Livingstone [1963] has clearly demonstrated for 23 tribal series from New Guinea a complete lack of correlations between 12 different combinations of serological characteristics (ABO, MN and Rh systems) and both, geographic and linguistic distances. But, Howells [1966] has obtained quite different result for the classic scopic and morphometric traits, i.e. significant and moderate correlations appeared between a set of taxonomic distances (Scopic, Size and Shape of Penrose) and the geographic and linguistic distances, calculated for 18 ethnic units from Bougainville, Melanesia. The same negative result was brought by analysis of matrix of Smith's distances calculated by Berry [1968] for 30 epigenetic traits of the cranium, what is concordant with the similar conclusion of Rightmire [1972] inferred from his study of African Negroids.

At the same time, the diagrams of average populational types (in stature and 3 main cephalometric indices) of the livings and 14 classic diameters and indices of the cranium have revealed divisions into clusters quite logical from the point of view of the mentioned above external criteria of evaluation and the systems of geographic races of v. Eickstedt and Imbelloni. Thus, there is no scrap of empirical evidence that the traits of simple mode of inheritance are superior in taxonomy versus traditional morphological characteristics.

Birdsell [1962] briefly explains this situation as follows: „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 the 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 continuously ongoing forces of selection, genetic drift, mutational pressure and hybridization” (p. 303).

If so, we are forced to accept consequently the assumption that the traditional polygenic traits are less apt to reflect the influences of microevolutionary agents which obscure the relationship between human populations (of course, with exception of hybridization which must be followed in genealogically oriented taxonomy). This was clearly postulated by Bielicki [1961].

2). The relation between heritability and ecosensitivity was appreciated for a larger set of traditional racial traits by Hiernaux [1963] and Wierciński [1970]. It appeared that the heritability of all

cephalometric indices is very high in relation to modifying influences of external environment. Especially, the facial characteristics, so important in raciology, have shown practically a lack of ecosensitivity.

Ad 3.6 (difficulties in following microevolution because types are static units)

1). Precisely, blood groups or any categorised hereditary metric or scopic characteristics are static in the same meaning and, so, they should not be used in following the course of microevolution what seems to be rather sheer nonsense. It is becoming immediately apparent since we are aware that the procedure of assigning individuals into particular racial types within a given population is equivalent to its description by use of multivariate nominal scale. The course of microevolution is followed then by observing the changes in frequency distributions, indifferently, whether in blood groups, a single category of a phenotypical trait or in a whole set of intervals of different traits (i.e. in typological composition or its somewhat distorted reduction into elementary composition).

A good illustration of such a possibility for the latter case was supplied by the results of typological analysis of successive chronological series of crania of the last millenium from the the Wiślica Region, Poland [Wierciński 1970]. The table 4 represents extremely regular changes in the racial compositions of these series which consist in gradual decrease of the more archaic elements, i.e. Cromagnoid, Highland and Mediterranean, on account of the increase of the Nordic and Laponoid ones. This result could not be the effect of the sole brachycephalisation process because:

- a) practically all the distinguished types (10 out of 11) invariably show increase of cephalic index,
- b) the facial characteristics have been used as typologically diagnostic traits while their populational means behave stationary in this time span.

Of, course, such gradual transformation throughout 9 centuries, without any documented migratory movement in this region or any trace of a sudden selective pressure in the time of Great Epidemics (which should manifest itself by some significant oscillation), can suggest only, more or less, stable pressure of natural selection (perhaps, both positive and negative ones).

2). The whole point in applying individual typology to raciological description of human populations, as some kind of multivariate nominal scale, is to define "naturally" the limits of the intervals for particular diagnostic traits, to use rather large number of the latter, and to make the whole system as much intersubjective as possible. All these are very

Table 4. Microevolutionary transformation of racial compositions of successive chronological series of crania in Wiślica region, Poland

Racial element	Mid-time point of the series						
	1050	1150	1250	1400	1600	1800	Pińczów 1930
Nordic (A)	17,5	27,9	31,8	35,7	40,9	38,6	42,5
Cromagnoid (Y)	10,0	11,6	4,5	—	2,3	2,9	3,4
Mediterranean (E) + Berberic (B)	22,5	17,4	11,4	3,6	6,8	5,7	7,4
Armenoid (H)	—	1,2	4,5	7,1	4,5	7,1	8,1
Laponoid (L) + Mongoloid (M)	5,0	10,5	25,0	28,6	34,1	40,0	36,3
Highland (Q)	45,0	31,4	22,7	25,0	11,4	5,7	2,3
Share of archaic types (Y, Q, AQ, YL, YQ, EQ, LQ)	85,0	67,6	45,4	35,7	22,7	14,3	8,6
Number of items	20	43	22	14	22	35	1096

Remarks: notice good comparability of racial compositions established on the livings (Pińczów, studied typologically by Michalski [1949]) in reference to cranial material (Wiślica 1800, studied by Wierciński [1970]), and a greater „immunity” of racial compositions against sampling error.

hard problems which await still their proper solutions on the basis of empirical studies.

The next question which must be concretely considered in each case is whether the ascertained similarities between typological (or racial) compositions of different populations could result from kinship relations (i.e. common descent and/or hybridization) or, from a convergent microevolution. The same refers to dissimilarities which could be caused, for example by the founder effect or a divergent microevolution while, the compared populations might descent from the same source, in not very remote time. Of course, the populationistic taxonomists face the same problems when they classify populations, characterised by allelotypes or their average morphotype.

Ad 3.7 (types as morphostatical artefacts)

1). The analogical danger appears, if populations are grouped into populational races

First of all, however, the meaning of so called “biological reality” of any taxonomic unit should be precised since, this notion is being so often abused in various issues between the adherents of this or other concept of race.

It seems that the following criteria might be proposed here:

4.1 — the relative genetic intra-unit homogeneity due to the proved common descent and/or hybridization;

Table 5. Comparison of variation (standard deviations) between populations and individual racial types

Kind of the data Craniometric indices	Individual variation within regional modern series from the Kielce District	Interpopulational variations within entire Europe	Intertype variability within the regional series from the Kielce District	Variability of the racial elements in a world-wide range
Cephalic	4.6	3.2	4.5	5.8
Upper facial	3.2	1.4	2.3	4.2
Nasal	4.3	1.3	3.0	7.7
Orbital	5.2	2.9	3.1	5.6
Number of items	177 - 194	17 - 19	13	16

4.2 — the depth of inter-unit differences measured not only statically by use of the taxonomic distance in a set of structural traits but also processually, i.e. by differences in functional characteristics and the course of ontogenetic development.

The results of applications of both these criteria, in reference to individual types and populations or populational races, has been already partially shown (see: table 1 and discussion of the objection 3.2). But, it is possible to add also some other data. The table 5 represents a comparison of standard deviations of the four classic craniometric indices, calculated for the series of modern crania from the Kielce District (intrapopulational variation), for the series of 19 means of the populations from different parts of modern Europe (interpopulational variability) and for the means of 13 individual types distinguished within the same sample from the Kielce District (intertype variability within one regional population).

It can be immediately seen that:

- a) the variation within one small regional population is greater in all the traits, in reference to the set of populations from all over the Europe;
- b) the intertype variability within the same regional population from Poland is greater in all the traits in reference to the same set of European populations.

It should be noticed that in the latter case sigmas were calculated for the material of means of comparable size.

Further comparison may be taken from the studies of Sikora [1964] on the differentiation of the course of ontogenetic development of the cephalic index (trend in 6 - 18 years of age), as referred to its division into 3 main categories, i.e. dolicho-meso and brachycephaly. It appeared that:

- a) the human populations, on a world-wide range, show clear cut differences between ontogenetic trends, i.e.: the dolichocephalic populations are stationary, the brachycephalic ones changed markedly towards gradual lowering of cephalic index while, the mesocephalic ones occupied intermediate position in degree of the latter trend;
- b) the intrapopulation fractions of individuals, defined by the same three categories of the cephalic index (derived from the small regional population from Cracow) show, in the longitudinal study, far greater differences than the populational trends and they proceed in the same direction.

Similar result was obtained by Sikora for the categories of total face index.

Of course, Sikora's investigations are only a first approximation to the problem of processually conceived differences between populational races and individual types and further extensive studies should be undertaken in this respect. Especially, comparisons of ontogenetic trends for the same racial types derived from different populations are strongly needed, naturally, after removing influences of socio-economical stratification.

At any rate, there is no reason for the belief that populational races are more "biologically real" (or lesser morphostatistical artefacts) than the individual types.

CONCLUDING REMARKS

All our considerations seem to support the postulate that we should stop the chaotic speculations and unfruitful arguments in the field of intraspecific taxonomy of recent man and instead proceed with empirical investigations of which results must be expressed in more precise terminology.

First of all, it might be useful to reject the term: human race, in reference to any intraspecific division of man, since:

- 5.1 — this notion is not used in one meaning;
- 5.2 — the human populations differ much from the animal ones (permanently changing boundaries in time and space, culturally determined breeding process, in fact, never truly panmictic and, cultural slackening of homogeneizing action of natural selection in the recent times);
- 5.3 — this notion bears frequently undesirable socio-political implications.

Actually, just the notion of the racial type is more neutral (i.e. less burdened in connection with 5.1-3) and it may be used in reference to all kinds of taxonomic units, distinguished on the basis of relative

similarity in a set of traits. Thus, it is logically meaningful to utilize such terms as: populational racial types (=populational races), geographic racial types (=geographic races) or, the individual racial types (individual fractions derived from different populations but similar in a set of diagnostic racial traits).

However, it should be always remembered that all these kinds of types differ in their taxonomic contents.

For example, "Mediterranean race" of Cappieri has quite different meaning than the "Mediterranean element" in the sense of individual typology.

But, even in the frame of one and the same concept, the taxonomic contents of particular racial types may be different due to various choice of diagnostic traits and taxonomic procedures. For example, the term: "Mediterranean type" in French typology covers something different than the same term used in Polish School (the latter type is far more rigidly defined). Therefore, we must be very cautious in all attempts of synonymisation.

In any case, it is impossible to escape the difficult and complicated problems of appreciating relationship between the peoples in order to follow their "natural history", and so, some kind of taxonomic studies are inevitable.

Perhaps, the most useful approach would be to apply various taxonomic concepts and methods, to have deeper and wider insight into the problem of these relationships.

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NIEKTÓRE ZAGADNIENIA WEWNĄTRZGATUNKOWEJ TAKSONOMII CZŁOWIEKA

ANDRZEJ WIERCIŃSKI

W ciągu ostatniego dwudziestolecia indywidualna typologia rasowa człowieka była ośrodkiem ożywionej i nader krytycznej dyskusji. W szczególności wiele zarzutów pod jej adresem zostało postawionych przez zwolenników populacyjnej i geograficznej koncepcji rasy. Niniejsza praca zawiera polemikę z tymi zarzutami oraz nowe propozycje terminologiczne.