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THE TEETH OF THE 1st MILLENIUM A.D. POPULATION IN LITHUANIA

ABSTRACT. — *The study of prehistoric odontological materials from Lithuanian territory from the 1st millennium A.D. demonstrate the mesodont character of this northern Caucasoid population of Middle European odontological type. Territorial odontological differences are negligible. No other northern, southern or eastern influence was recognized.*

KEY WORDS: *Odontology — Lithuania — Chronological Development.*

ETHNIC ODONTOLOGY AND ODONTO- GLYPHICS (*Part 1*)

The odontological data of prehistoric populations contribute to the knowledge of their anthropological character, to the history of their formation, and, in this way, they are of great importance for solving complicated ethnological problems. The odontological examination of the Baltic peoples (Lithuanians, Latvians, Sudovians and ancient Prussians) is of some interest to Slavonic anthropology, for there are many prehistorical and historical parallels between Balts and Slavs, and their ethnic history intertwines closely.

The odontological investigation of the prehistorical, historical and modern populations of Lithuania is one of the links in the chain of study of the Lithuanian ethnogenesis. The odontological picture of the entire modern population (Papreckienė I., 1981) as well as of the 2nd millennium A.D. population (Papreckienė I., Česnys G., 1981) has been studied, and relative homogeneity of the Middle European odontological type in modern Lithuanians

as well as the stability of the type in the territory of present Lithuania during the last seven centuries have been established. The present report is another step towards understanding the origin of these peoples and it has been realized with a view to determine the odontological type (or types) of the Baltic tribes, inhabiting Lithuania's territory in the 1st millennium A.D., to establish its possible geographical and chronological diversities and to check the odontological relationships between the 1st and the 2nd millennia populations. The 1st millennium is of particular importance to the Lithuanian ethnogenesis for the separation of tribes from the Baltic population took place just at that time.

MATERIALS AND METHODS

274 well preserved and 131 fragmental skulls, excavated in 46 burial sites (*Table 1, Fig. 1*) and deposited in the ossuary of the Department of Anatomy, Histology and Embryology Medical Faculty, the University of Vilnius, Lithuanian SSR were investigated, and 1281 teeth on the right side of the

maxilla and of the mandible were measured. Mesiodistal (MD_{cor}) and buccolingual (or vestibulolingual, VL_{cor}) crown diameters, the crown module (cor M), and the crown index (I_{cor}) were registered odontometrically. The enamel thickness on the M^2 , the distance I^1-I^1 , the crowding of I^2 , the I^2 reduction of the shape of lingual surface of the upper incisors (I^1 and I^2), the form of the upper molars, connected with the hypocone reduction, the shape of the lower molars, the distal trigonid crest (d.t.c.), the deflecting wrinkle (d.w.) of the metaconid, the inner medial supplementary tubercle (or tuberculum accessorium mediale internum, t.a.m.i) on the M_1 were checked odontoscopically. The crowns of the M_1 and M^1 from 79 infantile skulls were examined odontoglyphically. The course of the second metaconid groove (2 med) on the M_1 and the shape of the first paracone groove (1 pa) on the M^1 were registered by means of wax prints. Odontoscopical and odontoglyphical examination was carried out after A. Zubov (1968).

For the sake of statistical treatment, entire materials were grouped because the samples from separate cemeteries were too small. The grouping was undertaken on the basis of archaeological, chronological and geographical principles.

TABLE 1. The list of investigated Lithuanian materials in alphabetic order (numeration as in figure 1).

No	Burial site	Region	Period (cc.)	Number of skulls		
				Complete	Fragmen-tary	Total
1.	Akmeniai	Kelne	5	2	2	4
2.	Daujėnai	Pasvalys	3-6	3	2	5
3.	Delnica	Lazdijai	3-4	—	1	1
4.	Diktarai	Anykščiai	5-6	5	—	5
5.	Eiguliai	Kaunas	4-5	—	13	13
6.	Eitulionys	Trakai	4-5	1	—	1
7.	Gaičiūnai	Ukmerge	11-12	2	1	3
8.	Gėluva	Raseiniai	5	2	—	2
9.	Grauziai	Kėdainiai	5-7	6	—	6
10.	Griniūnai	Panevėžys	5-6	22	5	27
11.	Jakščiūčiai-Meškiai	Šiauliai	8-12	3	1	4
12.	Jauneikiai	Joniškis	5-7	5	5	10
13.	Jauneikiai	Joniškis	8-11	10	11	21
14.	Juodsodė	Telšiai	9-12	1	—	1
15.	Kairėnėliai	Radvižiškis	5-6	4	1	5
16.	Kriemala	Kaunas	7-8	2	—	2
17.	Krikštonys	Lazdijai	5-6	1	—	1
18.	Labūnava	Kėdainiai	5-6	3	2	5
19.	Lauksvydai	Kaunas	3-4	7	2	9
20.	Lygalaukiai	Zarasai	5	1	1	2
21.	Maudžiorai	Kelmė	4-5	2	2	4
22.	Maudžiorai	Kelmė	8-9	12	2	14
23.	Meldiniai	Pakruojis	6-8	2	—	2
24.	Noruišiai	Kelmė	3-4	—	1	1
25.	Obeliai	Ukmerge	5-6	30	3	33
26.	Pagrybis	Šilalė	5-7	16	4	20
27.	Paistriečiai	Pasvalys	7-8	1	—	1
28.	Pakrauglė	Vilnius	4-5	1	—	1
29.	Pamiškiai	Pasvalys	8-12	2	—	2
30.	Pašūsvys	Kėdainiai	5-7	—	1	1
31.	Pavirvytė-Gudai	Akmenė	10-11	4	4	8
32.	Plaučiškiai	Pakruojis	4-5	3	3	6
33.	Plinkaigalis	Kėdainiai	5-6	89	14	103
34.	Riklikai	Anykščiai	5	2	—	2
35.	Sargėnai	Kaunas	2-3	1	8	9
36.	Sauginiai	Šiauliai	5-6	3	2	5
37.	Serėdžius	Jurbarkas	3-4	1	2	3
38.	Taurapilis	Utena	5	3	—	3
39.	Upytė	Panevėžys	3-5	—	10	10
40.	Vaitiekūnai	Radvižiškis	3-4	12	3	15
41.	Valdomai	Šiauliai	9-11	3	1	4
42.	Veliuona	Jurbarkas	3-5	1	—	1
43.	Veršvai	Kaunas	2-5	—	22	22
44.	Zastaučiai	Mažeikiai	2-5	3	1	4
45.	Žaduvėnai	Telšiai	3-4	2	1	3
46.	Žeimelis	Joniškis	8-9	1	—	1
Total				274	131	405

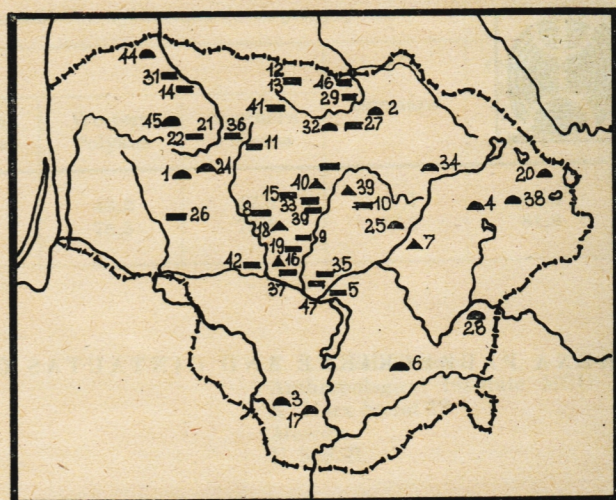


FIGURE 1. Situation of burial sites in the 1st millennium A.D. Lithuania with craniological materials (■ — burial grounds, ● — burial mounds, ▲ — unclear sites): 1 — Akmeniai, 2 — Daujėnai, 3 — Delnica, 4 — Diktarai, 5 — Eiguliai, 6 — Eitulionys, 7 — Gaičiūnai, 8 — Gėluva, 9 — Grauziai, 10 — Griniūnai, 11 — Jakščiūčiai-Meškiai, 12 — Jauneikiai (the 5th to 7th cc.), 13 — Jauneikiai (the 8th-11th cc.), 14 — Juodsodė, 15 — Kairėnėliai, 16 — Kriemala, 17 — Krikštonys, 18 — Labūnava, 19 — Lauksvydai, 20 — Lygalaukiai, 21 — Maudžiorai (the 4th-5th cc.), 22 — Maudžiorai (the 8th-9th cc.), 23 — Meldiniai, 24 — Noruišiai, 25 — Obeliai, 26 — Pagrybis, 27 — Paistriečiai, 28 — Pakrauglė, 29 — Pamiškiai, 30 — Pašūsvys, 31 — Pavirvytė-Gudai, 32 — Plaučiškiai, 33 — Plinkaigalis, 34 — Riklikai, 35 — Sargėnai, 36 — Sauginiai, 37 — Serėdžius, 38 — Taurapilis, 39 — Upytė, 40 — Vaitiekūnai, 41 — Valdomai, 42 — Veliuona, 43 — Veršvai, 44 — Zastaučiai, 45 — Žaduvėnai, 46 — Žeimelis.

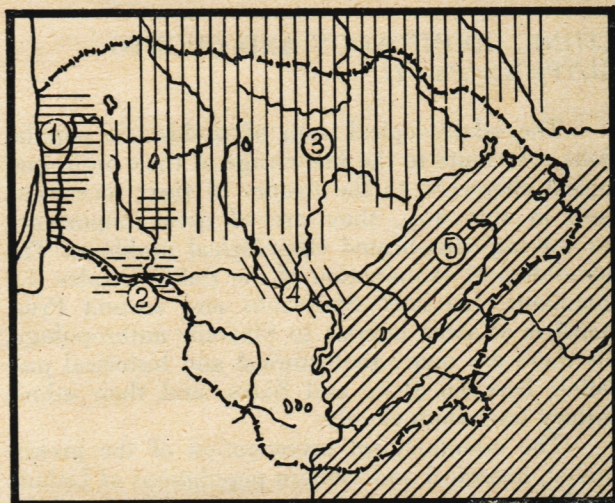


FIGURE 2. Cultural regions in the 1st-4th cc. A.D. Lithuania (after A. Tautavičius, 1980): 1 — burial grounds with stone crowns, 2 — burial grounds of the Nemunas river delta, 3 — burial mounds, 4 — burial grounds of Central Lithuania, 5 — the region of hatched ceramics.

Several cultural regions (Fig. 2) appear in the territory of present Lithuania (Lietuvos archeologijos atlasas, 1977), in the beginning of the 1st millennium (the 1st—4th cc.). Thus, the region of hatched pottery extended in the whole eastern part of the country from a present Lithuanian-Byelorussian border in the East up to the Šventoji river, lower reaches of the Neris river and middle reaches of the Nemunas river in the West. Unfortunately, this region has no burial sites. The central part of Lithuania (where the Neris, Nevėžis and Dubysa rivers fall into the Nemunas river) was occupied by the cultural group of the burial grounds of Central Lithuania. To the North of this region (between the Šventoji river in the east and Jura river in the west), a large cultural region of burial tumuli stretched, and it extended northward as far as the present Latvian territory. A strip of the Baltic seashore was taken up by the culture of graves with stone crowns, and a small cultural region of the burial grounds of the Nemunas river delta was situated on both banks of the lower reaches of the river. Unfortunately, we possess skeletal materials only from two cultures — from the Central Lithuanian burial grounds and from the tumuli burial region. Thus, four combined samples from the 2nd—4th cc. were formed according to the localization of the cemeteries: 1. the eastern sample of the Central Lithuanian burials (Eiguliai, Veršvai, Sargenai), 2. the western sample of the same cultural region (Lauksvydai, Seredžius, Veliuona), 3. the sample from the transitional territory between the tumuli cultures and the Central Lithuanian earth graves (Vaitiekunai, Upyte), 4. the sample of the tumulus culture (Plaučiškiai, Daujenai, Zastaučiai, Žaduvėnai, Akmeniai, Noriškiai).

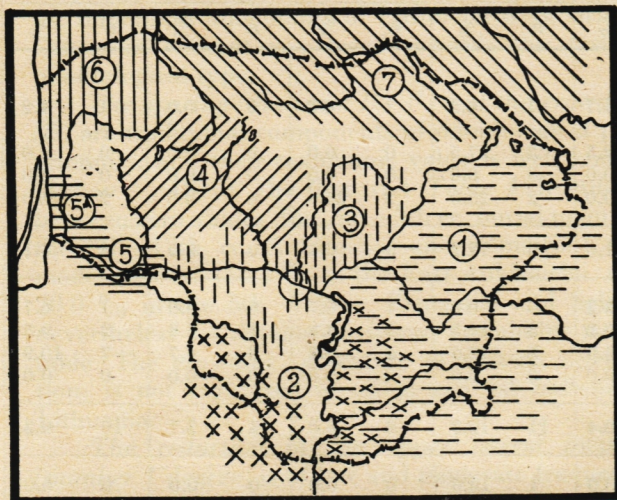


FIGURE 3. The Baltic tribes in the territory of Lithuania in the 2nd half of the 1st millennium A.D. (after A. Tautavičius, 1980): 1 — the Lithuanians (East Aukštaitiai), 2 — the Jotvingiai (Sudovians), 3 — the Aukštaitiai (West Aukštaitiai), 4 — the Žemaičiai (Samogitians), 5 — the Skalviai, 6 — the Lamatiečiai, 7 — the Kuršiai (Couronians), 7 — the Zemgaliai (Semigalians) and Seliai.

In the middle of the 1st millennium (the 4th to 5th cc.), the tumulus culture was replaced by the earth graves culture. Maudžiorai, the earliest earth grave in the former tumulus area, provided very scanty craniological material, that is why it was not treated separately and has been included only in the summary tables of the 1st millennium population.

The separation of the Baltic tribes began at the same time in the present Lithuanian territory (Tautavičius A., 1980). The area of the East Lithuanian burial mounds developed in a former region of hatched ceramics (Fig. 3), and the East Aukštaitiai (or the Lithuanians proper) are considered to be the founders of this culture. The southern part of the hatched ceramics area and the left bank of the Nemunas river were inhabited by the Jotvingiai (Jatvingians or Sudovians) who created the culture of the stone burial mounds. The region between the rivers of Šventoji and Nevėžis belonged to the West Aukštaitiai (or the Aukštaitiai proper) at this time. The Žemaičiai (Samogitians) appeared to the North-West of this region (between the Nevėžis and Jura rivers), the Lamatiečiai and the Skalviai inhabited the lower reaches of the Nemunas river, the Kuršiai (Couronians) occupied the northern part of the Lithuanian seashore, and the Žemgaliai (Semigalians) and the Seliai (Selians) inhabited the upper reaches of the Venta, Muša and Nemunelis rivers (North Lithuania). According to this, the 5th—7th cc. craniological materials were divided into the following composite samples: 1. the West Aukštaitiai sample (Kriemala, Geluva, Graučiai, Griniunai), 2. the East Aukštaitiai sample (Lygalaukai, Pakraugle, Riklikai, Obeliai, Diktari, Taurapilis), 3. the Žemaičiai sample including burial sites from the transitional territory between the Žemaičiai and the West Aukštaitiai (Plinkaigalis, Kaireneliai, Sauginiai, Labunava, Pagrybis, Pašušvys), 4. the Žemgaliai and Seliai sample (Meldiniai, Jauneikiai).

Unfortunately, there are no odontological materials from the areas of the Kuršiai, the Skalviai and the Lamatiečiai. What concerns the Jotvingiai, they lived far to the south from the present Lithuania in the 1st half of the 1st millennium, their area was limited by the Bug river in the South (Nepokupnyj A., 1977). The Jotvingiai craniological characteristics are published (Česnys G., 1981), but the majority of skulls is deposited in Białystok (Poland) and is available with difficulty for odontological examination. Only two intact and one fragmentary skull of the Jotvingiai were excavated in Lithuanian territory (Delnica, Eitulionys, Krikėtonys), but this material is too small to form a separate sample.

The cremation of the deads began to spread from the eastern part of Lithuania in the 2nd half of the 1st millennium. Skeletal burial grounds are found only in the north-west of the country in the 8th—12th cc. It has been possible to form only two combined series of skulls from this period: 1. the Žemaičiai sample (Juodsode, Maudžiorai), 2. the Žemgaliai and Seliai sample including the transitional area with the Kuršiai and Žemaičiai (Pavirvyte-Gudai, Paistriečiai, Jauneikiai, Žeimelis, Valdomai, Pamiškiai, Jakštaičiai-Meškiai). Only two well pre-

served and one fragmentary skull of the Aukštaičiai were excavated in East Lithuania (Gaiciūnai), they are included into the pooled samples of the 8th to 12th and the 2nd—12th cc.

RESULTS AND DISCUSSION

Tooth dimensions are under a polygenic control (Hanihara K., Ueda K., 1979), they show insignificant sexual dimorphism (Kitahara-Frisch J., 1979, Harris E., Nweeia M., 1980), though slight

side differences are noted (Jordanov J., Bočev V., 1978). There are data on the dependence of tooth dimensions on general human physique (Garn S. M. et al., 1979) and on pathology (Barden H. S., 1980). Nevertheless, they can serve to some extent as marking traits of the main human races.

According to our data, mesiodistal diameter of the molars corresponds to the formula $M^1 < M^2 < M^3$ and $M_1 < M_2 < M_3$ (Table 2), while the buccolingual one corresponds to the formula $M^2 < M^1 < M^3$ and $M_1 < M_2 < M_3$. The crown module, that reflects the general tooth size, corresponds to the formula

TABLE 2. Tooth dimensions of Lithuania's inhabitants in the 1st millennium A. D. (mm)

Tooth	N	VL _{cor}				MD _{cor}				M _{cor}				I _{cor}			
		M	m(M)	S	V	M	m(M)	S	V	M	m(M)	S	V	M	m(M)	S	V
13	113	8.02	0.05	0.55	6.8	7.30	0.03	0.40	5.5	7.66	0.04	0.42	5.4	110.01	0.65	6.93	6.2
14	113	8.87	0.05	0.52	5.8	6.20	0.03	0.34	5.4	7.54	0.03	0.38	5.1	143.15	0.67	7.21	5.0
15	100	9.03	0.06	0.55	6.1	6.12	0.04	0.45	7.3	7.57	0.04	0.43	5.7	147.94	0.89	8.91	6.0
16	125	11.08	0.05	0.55	4.9	9.77	0.04	0.50	5.1	10.42	0.04	0.45	4.3	113.48	0.50	5.68	5.0
17	123	11.16	0.06	0.64	5.7	9.10	0.05	0.57	6.3	10.13	0.04	0.53	5.2	123.00	0.66	7.36	5.9
18	62	10.54	0.11	0.89	8.4	8.18	0.09	0.77	9.4	9.36	0.08	0.69	7.4	129.51	1.66	13.11	10.1
43	98	7.25	0.05	0.53	7.4	6.43	0.04	0.43	6.7	6.84	0.04	0.44	6.4	112.87	0.67	6.68	5.9
44	97	7.13	0.05	0.45	6.4	6.17	0.03	0.34	5.5	6.65	0.03	0.35	5.2	115.63	0.68	6.78	5.8
45	105	7.84	0.05	0.51	6.5	6.42	0.05	0.53	8.3	7.13	0.04	0.46	6.5	122.52	0.74	7.67	6.2
46	139	10.03	0.04	0.51	5.1	10.28	0.04	0.54	5.2	10.15	0.04	0.47	4.7	97.71	0.35	4.21	4.3
47	130	9.73	0.05	0.55	5.7	9.97	0.05	0.57	5.7	9.85	0.04	0.52	5.3	97.69	0.37	4.31	4.4
48	76	9.32	0.08	0.78	7.6	9.79	0.08	0.72	7.3	9.55	0.07	0.67	7.0	95.29	0.55	4.82	5.0

TABLE 3. The frequency of the M₂ enamel prolongments

Time period	Sample	N	Prolongments absent		Degrees of prolongations*							
					4		5		6		5 + 6	
			n	%	n	%	n	%	n	%	n	%
The 2nd-5th cc.	The Central Lithuanian burial grounds (eastern part)	24	22	91.7	1	4.2	1	4.2	0	0.0	1	4.2
	The Central Lithuanian burial grounds (western part)	8	5	62.5	3	37.5	0	0.0	0	0.0	0	0.0
	The transitional territory	9	9	100.0	0	0.0	0	0.0	0	0.0	0	0.0
	The burial mound culture	8	4	50.0	2	25.0	2	25.0	0	0.0	2	25.0
	Totally	49	40	81.6	6	12.2	3	6.1	0	0.0	3	6.1
The 5th-7th cc.	The West Aukštaičiai	15	14	93.3	0	0.0	1	6.7	0	0.0	1	6.7
	The East Aukštaičiai	21	16	76.2	3	14.3	1	4.8	1	4.8	2	9.5
	The Žemaičiai	64	49	76.6	8	12.5	4	6.3	3	4.7	7	10.9
	The Žemgaliai and Seliai	7	7	100.0	0	0.0	0	0.0	0	0.0	0	0.0
	Totally	107	86	80.4	11	10.3	6	5.6	4	3.7	10	9.3
The 8th-12th	The Žemaičiai	10	9	90.0	1	10.0	0	0.0	0	0.0	0	0.0
	The Žemgaliai and Seliai	22	16	72.7	3	13.6	3	13.6	0	0.0	3	13.6
	Totally**	35	28	80.0	4	11.4	3	8.6	0	0.0	3	8.6
2—12	Total***	193	155	80.3	21	10.9	12	6.2	5	2.6	17	8.8

* numbers 7 and 8 were absent in present materials

** including 3 skulls from the 8th—12th cc. Gaiciūnai burial site (the Aukštaičiai)

*** including 2 skulls from the 4th—5th cc. Maudžiorai burial site

$M1 < M2 < M3$ in our materials, too. The inhabitants of the 1st millennium Lithuania were mesodonts judging from $M_{cor} M^1$. This is characteristic of the Northern Caucasoids (Zubov A., 1968), while the Southern Caucasoids are mainly microdonts. The crown index of M^2 and M^3 , that defines the crown shape, fluctuates about 125.0 % ($I_{cor} M^2 = 123.0$ and $I_{cor} M^3 = 129.5$). Such a high index is typical of Caucasoid populations. According to the crown indices of lower molars, the inhabitants of the 1st millennium Lithuania are considered to belong to the middle category (mesodonts).

The enamel extensions are valuable odontological traits while investigating palaeoanthropological materials, for the masticatory surfaces of the molars are usually markedly abraded in ancient skulls, and odontological traits situated on the other surfaces of the crown rise in their diagnostic importance (Zubov A., 1973). The frequency of the enamel extensions does not reach 30.0 % in Caucasoid populations. The highest percentage (25.0) of the M^2 enamel extensions (numbers 5 and 6) was registered in the area of the 2nd–5th cc. burial mounds in our materials (Table 3). In the 5th–7th cc., a low frequency of this trait was characteristic of the Aukštaičiai and the Žemaičiai, and its pronounced forms disappeared completely in the same tribes in the 8th–12th cc. In general, pooled series of the three above-mentioned periods (the 2nd–5th, the 5th–7th and the 8th–12th cc.) show an extremely low incidence (6.1 %, 9.3 % and 8.6 % respectively) of pronounced forms (numbers 5 and 6) of the M^2 enamel extensions. No case of numbers 7 and 8 of the trait was registered in the pooled collection of the 1st millennium skulls, the frequency of numbers 5 and 6 having been 8.8 % and that of number 4 having been as low as 10.9 %. Thus, according to the frequency and degree of the enamel extensions, the 1st millennium inhabitants of Lithuania were strictly Caucasoid without any trend towards the eastern odontological type.

The spacing (diastema I^1 – I^1) and the crowding (I^2) are traditional components of odontological programmes, and their taxonomic value is well known (Zubov A., 1973). The first trait (Table 4) fluctuates between zero values (the 2nd–5th cc. burial mounds, the 8th–12th cc. Aukštaičiai and Žemaičiai) and moderate ones (18.2 % in the East Aukštaičiai, and 20.0 % in the 5th–7th cc. Žemgaliai and Sėliai), nevertheless no regular territorial variability is notable. The crowding, a feature of eastern orientation, is not registered at all in the 1st millennium Lithuania.

The reduction of the upper lateral incisors (number 1 degree) is of low and moderate frequency in our materials (Table 4). The highest percentage is characteristics of the 2nd–5th cc. skulls. It is necessary to point out the maximal incidence (28.6 % and 20.0 %) of this trait in the eastern and western part of the Central Lithuanian burial ground area. At the same time period, no traces of the trait (number 1) are found in other cultural regions, nevertheless one skull from the burial mound area has number 2 reduction. We agree with A. Zu-

bov (1979) that pronounced forms (numbers 2 and 3) of the I^2 reduction are considered to be a southern odontological peculiarity, but a small amount of skulls investigated (8) does not allow us to draw any conclusion on this subject. In general, the variability of number 1 degree of the I^2 reduction was very marked in the 1st millennium Lithuania.

The shovel-shaped upper incisors are quite common in Mongoloids. The feature is under a strict genetical control (Blanco R., Chakraborty R., 1976, Portin P., Alvesalo L., 1974), though chronological changes in its incidence (decrease) are observed (Salivón I. I., 1971–1972, Brabant H., Libotte M., 1974). Our data confirm a slight chronological decrease of their shovel-shape. Thus, the initial stage of the I^1 shovel-shape (number 1 degree) appears in 4.6 % and pronounced stage (numbers 2 and 3) — in 0.3 % of modern Lithuanians (Paprečienė I., 1981). The frequency of this trait was correspondingly 5.4 % and 0.4 % in the 14th to 17th cc. Lithuanians (Paprečienė I., Česnys G., 1981). The shovel-shaped I^1 were somewhat more frequent in the 1st millennium (12.7 % and 0.8 % respectively), however, their percentage remained typical of the Caucasoid populations. A rather high incidence (28.6 %) of number 1 degree was found in the 2nd–5th cc., especially in the burial mound sample of this period. It is impossible to presume the admixture of an oriental component in this sample for pronounced stages (number 2 and 3) of shovel-shaped incisors were not found at all. The maximum incidence (7.7 %) of the pronounced (number 2 and 3) shovel-shaped I^1 was characteristic of the 8th–12th cc. Žemgaliai and Sėliai. It is difficult to explain such a focal increase of the trait in this area since shovel-shaped I^1 were not found at all in the 5th–7th cc. Žemgaliai and Sėliai.

The lingual surface of the I^2 varies usually more showing a higher percentage of their shovel-shape. The same picture is characteristic of our materials, too (Table 4).

The hypocone reduction of upper molars is an odontological trait that varies quite irregularly even among racially close populations (Zubov A., 1979). In this way, it is of a low taxonomic value. In addition, it is sensitive to chronological changes (Donina N. I., 1969, Kočiev R. S., 1971, Graver R., 1974, Paprečienė I., Česnys G., 1981, Frayer D. W., 1977).

According to our data, the M^1 preserved an initial type 4 in all samples (Table 4). The form 4— was found only in one skull (1.6 %) of the 5th–7th cc. Žemaičiai sample, and variants 3+ and 3 have not been found at all. On the other hand, the frequencies of the M^2 hypocone reduction (the sum of 3+ and 3) show a rather marked territorial diversities, which is quite natural.

The shape of the lower molars, especially of M_1 , is a very valuable trait in ethnic odontology. The M_1 had commonly five cusps (92.3 %) in the 1st millennium craniological materials with the form +5 prevailing (42.1 %). Consequently, the population belongs to the Middle European odontological type noted for a low level of M_1 reduction and a high

TABLE 4. *Odontological and odontophylphical indices in the 1st millennium A. D. Lithuania*

Time period	No	Sample	Spacing I ¹ -I ¹		Growth		Reduction I ²				Shovel-shaped I ¹		The I ² shovel-shape			The M ₁ crown shape			
			N	%	N	%	N	O	1	2	3	2+3	N	1	2+3	N	4	4-3	3+3
The 2nd-5th cc.	1.	The Central Lithuanian burial grounds (eastern part)	13	7.7	43	0.0	7	71.4	28.6	0.0	0.0	0.0	8	0.0	0.0	5	20.0	0.0	0.0
	2.	The Central Lithuanian burial grounds (western part)	3	0.0	8	0.0	5	80.0	20.0	0.0	0.0	0.0	5	0.0	0.0	5	100.0	0.0	0.0
	3.	The transitional territory	8	12.5	21	0.0	8	100.0	0.0	0.0	0.0	0.0	6	50.0	0.0	4	50.0	0.0	0.0
	4.	The burial mound culture	7	0.0	16	0.0	8	87.5	0.0	12.5	0.0	12.5	9	55.6	0.0	6	50.0	0.0	0.0
The 5th-12th cc.	5.	Total	31	6.5	88	0.0	28	85.7	10.7	3.6	0.0	3.6	28	28.6	0.0	20	40.0	0.0	0.0
	6.	The West Aukštaitiai	17	11.8	31	0.0	18	100.0	0.0	0.0	0.0	0.0	9	0.0	0.0	11	9.1	9.1	0.0
	7.	The East Aukštaitiai	22	18.2	38	0.0	20	85.0	15.0	0.0	0.0	0.0	15	6.7	0.0	17	17.6	5.9	0.0
	8.	The Žemaitiai	66	10.6	96	0.0	58	96.6	3.4	0.0	0.0	0.0	54	9.3	0.0	41	41.5	4.9	0.0
The 8th-12th cc.	9.	The Žemgallai and Sēliai	5	20.0	7	0.0	4	100.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2	50.0	0.0	0.0
	10.	Total	110	12.7	172	0.0	100	95.0	5.0	0.0	0.0	0.0	80	7.5	0.0	71	30.9	5.6	0.0
	11.	The Žemaitiai	8	0.0	14	0.0	7	100.0	0.0	0.0	0.0	0.0	3	33.3	0.0	3	0.0	33.3	0.0
	12.	The Žemgallai and Sēliai	14	7.14	28	0.0	18	94.4	5.6	0.0	0.0	0.0	13	7.7	7.7	14	28.6	7.1	0.0
The 12th cc.	13.	Total*	24	4.2	45	0.0	28	96.4	3.6	0.0	0.0	0.0	17	11.8	5.9	18	22.2	16.7	0.0
	14.	Total (the 1st mill.)**	165	10.3	308	0.0	158	93.7	5.7	0.6	0.0	0.6	126	12.7	0.8	110	30.9	6.4	0.0

Sample No	The M ₂ crown shape				The M ₁ crown shape				The M ₁ crown shape		Distal trigonoid crest	Deflecting metaconid wrinkle		T. a. m. i.		The run of 2 med on the M ₂			The shape of 1 pa on the M ₁		
	N	4	4—	3 and 3+	N	The M ₁ crown shape		N	five cus-ped	four cus-ped		N	%	N	%	N	2 med (II)2 med (III)2 med (fc)	N	1	2	3
						six cus-ped	five cus-ped														
1.	9	22.2	44.4	0.0	33.3	—	—	—	—	—	2	0.0	—	—	—	—	—	—	—	—	—
2.	5	40.0	40.0	0.0	20.0	—	—	—	—	—	2	50.0	50.0	—	—	—	—	—	—	—	—
3.	4	25.0	75.0	0.0	0.0	2	50.0	0.0	0.0	0.0	3	0.0	0.0	2	0.0	3	0.0	100.0	0.0	0.0	0.0
4.	6	16.7	33.3	0.0	50.0	5	0.0	100.0	40.0	0.0	5	0.0	0.0	5	0.0	5	0.0	50.0	0.0	33.3	50.0
5.	24	25.0	45.8	0.0	29.2	7	14.3	85.7	28.6	0.0	4	50.0	50.0	8	0.0	10	0.0	6	66.7	0.0	33.3
6.	5	0.0	60.0	0.0	40.0	3	0.0	100.0	100.0	0.0	3	0.0	100.0	3	0.0	4	0.0	2	50.0	0.0	50.0
7.	14	28.6	57.1	0.0	14.3	9	0.0	100.0	33.3	0.0	5	20.0	80.0	8	0.0	10	0.0	3	0.0	66.7	33.3
8.	32	9.4	71.9	0.0	18.8	38	2.6	94.7	41.2	2.6	15	0.0	100.0	37	0.0	42	0.0	28	17.9	25.0	57.1
9.	5	0.0	60.0	20.0	40.0	3	0.0	66.7	33.3	33.3	2	0.0	100.0	3	0.0	3	0.0	—	—	—	—
10.	56	12.5	66.1	1.8	21.4	53	1.9	94.3	45.7	3.8	25	4.0	96.0	51	0.0	59	0.0	33	18.2	27.3	54.5
11.	5	20.0	40.0	0.0	40.0	1	0.0	100.0	100.0	0.0	—	—	—	—	—	—	—	—	—	—	—
12.	9	11.1	55.6	0.0	33.3	3	0.0	66.7	0.0	33.3	2	50.0	50.0	4	0.0	4	0.0	2	0.0	0.0	100.0
13.	16	12.5	50.0	0.0	37.5	5	0.0	80.0	25.0	20.0	3	33.3	66.7	6	0.0	6	0.0	2	0.0	0.0	100.0
14.	96	15.6	58.3	1.0	26.0	65	3.1	92.3	42.1	4.6	32	12.5	87.5	67	0.0	75	0.0	41	24.4	21.9	53.6

* including 3 skulls from the 8th—12th cc Gaiciūnai burial site (the Aukštaitiai)

** including 2 skulls from the 4th—5th cc. Maudžiorai burial site

frequency of the + crown pattern. The incidence of four-cusped as well as six-cusped M_1 was low (4.6 % and 3.1 % correspondingly) in our pooled sample. A focal increase of the six-cusped M_1 happened in the 2nd–5th cc. transitional territory between areas of the burial mounds and central Lithuanian burial grounds, but an extremely scanty material (2 skulls) of this sample does not allow any generalization. Nevertheless, a high incidence of the four-cusped M_1 (33.3 %) was characteristic of the 5th–7th and the 8th–12th cc. Žemgaliai and Seliiai (northern part of Lithuania). This gracilization might be connected with some influence of the North European (or Finnish) odontological type. This hypothesis can be supported by the fact that a combination of some odontological peculiarities in the modern population of North Lithuania (the districts of Joniškis and Pasvalys) demonstrates slight traces of gracilization, reflecting the influence of the North European odontological type (Papreckienė I., 1981).

The M_2 reduction was rather marked in the 2nd–12th cc. Lithuania; the incidence of the four-cusped M_2 being as high as 87.5 %. According to Zubov A. (1979) this is typical of Northern Caucasoids.

The distal trigonid crest, the deflecting wrinkle of the metaconid and the inner medial supplementary tubercle are odontological features of high diagnostic value. Lithuania lays in a zone of low frequencies of the distal trigonid crest. It was not found in the 1st millennium samples at all. Since this trait is connected with the eastern and especially with the southeastern areas of Europe (Zubov A., 1979), its absence can serve as an argument against the admixture of the southern gracile odontological type in the 1st millennium Lithuania. The deflecting wrinkle of the metaconid is the main "oriental" indicator that penetrated Europe most intensively from the east via the "northern channel" (Zubov A., 1979). This trait is extremely rare in Lithuania, and only one case has been registered in the 1st millennium samples (i.e. in the 5th–7th cc. Žemaičiai). The low incidence of this trait is characteristic of the Middle European odontological type. The inner medial supplementary tubercle was completely absent in our material.

The run of the second metaconid furrow (2 med) on the M_1 is one of odontoglyphical variants. Absolutely non-abraded teeth are needed in order to recognize it. Dental attrition was very intensive and it started early, that is why only molars of non-adults are usually used. Within the confines of the variation span of the Western odontological complex, a high incidence of the version 2 med (II) is considered to be a northern peculiarity. The incidence of this version in our pooled sample (24.4 %) can not be regarded as statutory. In general, the second metaconid furrow mostly (53.6 %) used to fall into a central pit (fc) in our samples, but it is difficult to assess the traces of the admixture of the South European gracile odontological type.

The shape of the first paracone furrow (1 pa) belongs also to the domain of odontoglyphics. The third type, or lyre-shaped 1 pa, is taken into account

usually. The lyriform 1 pa is a satisfactorily examined marker of the Mongoloid race. It was found quite rarely (3.1 %) in the 1st millennium Lithuanian skulls.

Thus the 2nd–12th cc. inhabitants of Lithuania were noted for the absence of the distal trigonid crest and the crowding, for a very rare appearance of the deflecting metaconid wrinkle (2.1 %), for a rather low frequency of number 1 and 2 + 3 degree of the shovel-shaped I^1 (12.7 % and 0.8 % correspondingly), of six-cusped (3.1 %) and four-cusped (4.6 %) lower molars, of numbers 2 + 3 degree of the I^2 reduction (0.6 %) and of lyre-shaped 1 pa (3.1 %), for moderate values of the spacing (10.3 %), for slightly increased appearance of +5 pattern on the M_1 crown (42.1 %) and of four-cusped M_2 forms (87.5 %). On these grounds, the 1st millennium inhabitants of Lithuania represent the Middle European odontological type. In this case, it is possible to speak about "purity" of the western odontological complex because of the absence of the distal trigonid crest, a low percentage of the deflecting metaconid wrinkle, the third type of the first paracone furrow and the shovel-shaped medial incisors.

A comparison of different geographical regions demonstrates a relative odontological homogeneity in the 2nd–12th cc. The focal increase in the frequency of number 1 degree of the shovel-shaped I^1 (50.0 %) and the six-cusped M_1 (50.0 %) is not coupled with a rise in the percentage of the deflecting metaconid wrinkle (0.0 %), the four-cusped M_1 (0.0 %), the distal trigonid crest (0.0 %) and the third form of 1 pa on the M^1 (0.0 %) in the 2nd to 5th cc. transitional territory between areas of the burial mounds and the Central Lithuanian burial grounds. An increase of number 1 degree of the shovel-shaped M^1 (55.6 %) and the third form of 1 pa on the M^1 (16.7 %) is not followed by a rise in a percentage of number 2 + 3 degrees of the shovel-shaped I^1 (0.0 %), the deflecting metaconid wrinkle (0.0 %) and the six-cusped M_1 (0.0 %) in the area of the 2nd–5th cc. burial mound culture. That is why it is impossible to suggest an admixture of the northern and eastern components in the odontological type of the 2nd–5th cc. inhabitants in general. Only the 5th–7th and the 8th–12th cc. Žemgaliai and Seliiai stand out against this homogeneous background. The increase in percentage of the four-cusped M_1 at both time periods (33.3 %) and of numbers 2 + 3 degree of the shovel-shaped I^1 in the 8th–12th cc. (7.7 %) is evident. This might be connected with the influence of the northern component, though no deflecting metaconid wrinkle has been found.

CONCLUSIONS

1. According to the tooth dimensions, the 1st millennium A.D. inhabitants of Lithuania were mesodonts, which is characteristic of the Northern Caucasoids.

2. The 2nd–12th cc. inhabitants represent a pronounced Middle European odontological type without any noticeable admixture of the Southern or northern gracile components.

3. Territorial odontological differences are unimportant, and only the 5th–7th and the 8th–12th cc. Žemgaliai and Seliai look a little peculiar against this homogeneous background.

4. There are no traces of chronological changes in an odontological picture during the 1st millennium A.D.

ACKNOWLEDGEMENT

The authors express their cordial gratitude to Professor A. A. Zubov, Moscow Institute of Ethnography, Academy of Sciences of the USSR, for his valuable advice while preparing the present paper.

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PATHOLOGY OF THE MASTICATORY APPARATUS (Part 2)

Paleopathological data on the epidemiology of dental diseases can provide supplementary information for a better comprehension of their etiology and pathogenesis, consequently, the data are of practical value for modern stomatology. On the other hand, the condition of the masticatory apparatus reflects the general health status of the ancient populations and fills up considerably their anthropological picture. The purpose of the present study has been to investigate the incidence and intensity of caries and parodontosis in the 1st millennium A.D. Lithuania, to examine possible relations of these diseases to sex and age, to check their geographical variations and chronological changes during one thousand years (the 2nd–12th cc.), and to find other, more rare, pathological cases of the masticatory apparatus.

MATERIALS AND METHODS

274 complete and 131 fragmentary skulls, excavated in 46 burial sites, were investigated. The geographical localization and archeological characteristics of the burial sites as well as the amount of examined skulls are given in the 1st table of the first part of this paper, dealing with ethnic odontology and odontoglyphics of these populations.

The principles of caries diagnostics were following: periodontitis was stated if the caries cavity had touched the dental pulp, and simple caries was diagnosed according to the damage extent of the enamel and dentine (Ménard J., 1978). We have ignored an initial stage of parodontosis, when resorption of an alveolar ridge had not reached 1/3 of the root length. The following degrees of developed parodontosis were checked up: I° — resorption of the

alveolar ridge equals $1/3$ of the root length, II° — $1/2$, and III° — $3/4$ of the root length (Borovskiy E. B. et al., 1973).

RESULTS AND DISCUSSION

According to the investigation of 188 well-preserved skulls of adults, the incidence of caries was $52.7 \pm 3.6\%$ in the 2nd–12th cc. Lithuania ($47.4 \pm 8.1\%$ — in the 2nd–5th cc., $60.9 \pm 4.6\%$ — in the 5th–7th cc., and $31.4 \pm 7.8\%$ in the 8th–12th cc.). Thus the highest incidence of caries was characteristic of the 5th–7th cc. period. A similar frequency was established in the 1st millennium A.D. skeletal materials from various European countries: Bulgaria — 47.6 – 59.3% (Boev P., Maslinkov D., 1965), Roumania — 50.0% (Popovici I., 1976), Poland — 62.0% (Otocki P., Borysewicz M., 1976) and 63.8% (Stopa J., Perzyna B., 1978), Czechoslovakia — 51.0% (Tichá B., 1977), Hungary — 39.1 – 41.4% (Tóth K., 1970), France — 35.0% (Ménard J., 1978).

The percentage of carious teeth depended on the person's age in the 2nd–5th cc. Lithuania (Table 1), nevertheless the largest amount of carious teeth appeared in the age group of 30–40 years and decreased in older age groups in the 8th–12th cc. In general, 4.9% teeth were carious in the 2nd to 12th cc. Lithuania. Cariosity was somewhat lower in synchronous materials from Georgia: the 1st–4th cc. — 1.4% , and the 5th–10th cc. — 2.4% (Inašvili M. Z., 1973). On the other hand, it was in the 1st–2nd cc. Romans and Jews (Smith P., Tau S., 1978) as high as in our materials (5.6% and 4.7% correspondingly). The intensity of caries was not very high in Lithuania — every investigated 20th tooth was affected. Multiple carious damage (several cavities on the same teeth) was relatively rare in the 2nd–5th and the 5th–7th cc (3.4% and 2.7% correspondingly), and none of them was found in the 8th–12th cc. In general, this period stands out for a lower percentage of carious teeth in comparison with the previous periods.

The cariosity of the upper teeth exceeded that of lower ones in all three periods (Table 2), and this

TABLE 1. Caries in the 2nd–12th cc. Lithuania

Time period	Age (years)	Investigated skulls		Investigated teeth	Intra-vital-ly ex-tract-ed teeth	Carious teeth		Teeth with several caries cavities	
		Com-ple-te	Frag-men-tary			n	%	n	%
The 2nd–5th cc.	Subadults	3	1	99	0	1	1.0 ± 1.0	0	0.0 ± 0.0
	20–30	13	29	523	4	18	3.4 ± 0.8	2	11.1 ± 7.4
	30–40	8	3	253	0	8	3.2 ± 1.1	0	0.0 ± 0.0
	40–50	7	15	302	32	24	7.9 ± 1.6	0	0.0 ± 0.0
	Over 50	5	8	124	48	8	6.5 ± 2.2	0	0.0 ± 0.0
	Total over 20	33	55	1,202	84	58	4.8 ± 0.6	2	3.4 ± 2.4
The 5th–7th cc.	Subadults	11	0	320	1	3	0.9 ± 0.5	0	0.0 ± 0.0
	20–30	20	6	1,134	6	27	2.4 ± 0.5	0	0.0 ± 0.0
	30–40	27	5	753	47	47	6.2 ± 0.9	1	2.1 ± 2.1
	40–50	32	1	802	111	47	5.9 ± 0.8	2	4.3 ± 2.9
	Over 50	36	7	684	262	64	9.4 ± 1.1	2	3.1 ± 2.2
	Total over 20	135	19	3,373	426	185	5.5 ± 0.4	5	2.7 ± 1.2
The 8th–12th cc.	Subadults	2	0	62	0	0	0.0 ± 0.0	0	0.0 ± 0.0
	20–30	13	3	393	0	1	0.3 ± 0.3	0	0.0 ± 0.0
	30–40	8	2	188	22	11	5.9 ± 1.7	0	0.0 ± 0.0
	40–50	9	6	301	22	14	4.7 ± 1.2	0	0.0 ± 0.0
	Over 50	3	3	102	24	3	2.9 ± 1.7	0	0.0 ± 0.0
	Total over 20	33	14	984	68	29	2.9 ± 0.5	0	0.0 ± 0.0
The 2nd–12th cc.	Subadults	16	1	481	1	4	0.8 ± 0.4	0	0.0 ± 0.0
	20–30	66	38	2,050	10	46	2.2 ± 0.3	2	4.3 ± 3.0
	30–40	43	10	1,194	69	66	5.5 ± 0.7	1	1.5 ± 1.5
	40–50	48	22	1,405	165	85	6.0 ± 0.6	2	2.3 ± 1.6
	Over 50	44	18	910	334	75	8.2 ± 0.9	2	2.7 ± 1.9
	Total over 20	201	88	5,559	578	272	4.9 ± 0.3	7	2.6 ± 1.0

TABLE 2. Sexual dimorphism of caries and its frequency on the maxilla and mandible in adults

Time period	Age (years)	General amount of investigated teeth	Mandible		Maxilla		Males		Females	
			N	n	%	N	n	%	N	%
The 2nd-5th cc.	20-30	523	191	3	1.6±0.9	332	15	4.5±1.1	157	1.9±1.1
	30-40	253	115	1	0.9±0.9	138	7	5.1±1.9	156	3.2±1.4
	40-50	302	101	12	11.9±3.2	201	12	6.0±1.7	242	7.0±1.6
	Over 50	124	46	1	2.2±2.2	78	7	9.0±3.2	57	14.0±4.6
Total		1,202	453	17	3.8±0.9	749	41	5.5±0.8	612	5.4±0.9
The 5th-7th cc.	20-30	1,134	567	18	3.2±0.7	567	9	1.6±0.5	562	2.8±0.7
	30-40	753	396	24	6.1±1.2	357	23	6.4±1.3	519	4.2±0.9
	40-50	802	411	17	4.1±0.9	391	30	7.7±1.3	651	4.3±0.8
	Over 50	684	372	32	8.6±1.5	312	32	10.3±1.7	449	9.1±1.4
Total		3,373	1,746	91	5.2±0.5	1,627	94	5.8±0.6	2,181	4.9±0.5
The 8th-12th cc.	20-30	393	198	1	0.5±0.5	195	0	0.0±0.0	162	0.0±0.0
	30-40	138	113	7	6.2±2.3	75	4	5.3±2.6	133	1.5±1.1
	40-50	301	147	5	3.4±1.5	154	9	5.8±1.9	291	4.8±1.3
	Over 50	102	50	0	0.0±0.0	52	3	5.8±3.2	83	1.2±1.2
Total		984	508	13	2.6±0.7	476	16	3.4±0.8	669	2.5±0.6
Total		5,559	2,707	121	4.5±0.4	2,852	151	5.3±0.4	3,462	4.5±0.4
Total									2,097	5.5±0.5

TABLE 3. Frequency of caries in different tooth groups

Time period	The incisors and canines			The premolars			The molars		
	N	n	%	N	n	%	N	n	%
The 2nd—5th cc.	449	1	0.2±0.2	378	8	2.1±0.7	550	51	9.3±1.2
The 5th—7th cc.	1,317	12	0.9±0.3	1,009	40	4.0±0.6	1,229	133	10.8±0.9
The 8th—12th cc.	413	1	0.2±0.2	282	4	1.4±0.7	374	24	6.4±1.3
The 2nd—12th cc.	2,179	14	0.6±0.2	1,669	52	3.1±0.4	2,153	208	9.7±0.6

coincides with the synchronous data of other specialists (Baltrušaitienė K., 1962, Lunt D. A., 1974, Burns P. E., 1979), though contrary opinion can be found in the literature (Dolinar Z., Vidovič M., 1974, Titlbachová S. et al., 1976, Čechová L. et al., 1978).

Sex dimorphism of cariosity varied considerably in our materials. Thus, cariosity was higher in males in the 2nd–5th cc., and the site picture was characteristic of the two other periods (the 5th–7th and the 8th–12th cc.). In general, larger amount of affected teeth appears in females than in males in the pooled materials of the 2nd–12th cc. The literature data are very controversial, too. For instance, T. Kozaczek (1977) has estimated the prevalence of cariosity in females, and P. Otockí et al. (1976), S. Titlbachová et al. (1978) — in males.

The caries frequency in different tooth groups was examined in a part of our material (Table 3). The molars were among the most frequently affected (9.7 ‰), and the rarest localization of caries was that on the incisors and the canines (0.6 ‰). The majority of other authors (Boev P., Maslinkov D., 1961, 1965, Tóth K., 1970, Stopa J. et al., 1978) found the same picture in the 1st millennium.

From the point of view of clinical stomatology, the localization of caries cavities on different dental

surfaces and its chronological changes are of a considerable interest. The approximal dental surfaces were affected most often in the 2nd–5th cc., the 5th–7th cc. and the 8th–12th cc. Lithuania (Table 4). It was typical in other countries, too (Boev P., Maslinkov D., 1965, Stopa J., Perzyna B., 1978). The caries of masticatory surfaces diminished progressively and its localization on the tooth neck region prevailed in older age groups. That is especially true of the inhabitants of the 5th–7th cc. Lithuania. It might be connected with the degree of dental attrition (Paprečienė I., Česnys G., 1982).

There are many discrepant opinions concerning the degree of cariotic damage of the permanent dentition in the 1st millennium. L. Čechová and Titlbachová S. (1978) found no case of deep caries in the 10th–12th cc. craniological sample (59 skulls) of Prague inhabitants, while J. Stopa and B. Perzyna (1978) estimated as high frequency as 36.9 ‰ of deep caries in a synchronous (the 10th–12th cc.) craniological collection (299 skulls) from Cedynia, Poland. P. Boev and Maslinkov (1961) pointed out as low frequency as 6.7 ‰ and 10.7 ‰ of deep caries in the 7th–8th and the 8th–11th cc. Bulgaria. What concerns our data, deep caries was diagnosed very seldom (1.6 ‰, 5.7 ‰ and 6.9 ‰ in

TABLE 4. Caries localization on dental surfaces

Time period	Age (years)	N	Amount of caries cavities	Masticatory surface		Approximal surfaces		Dental neck region	
				n	%	n	%	n	%
The 2nd–5th cc.	Subadults	99	1	0	0.0±0.0	1	100.0±0.0	0	0.0±0.0
	20–30	523	18	1	5.6±5.4	17	94.4±5.4	0	0.0±0.0
	30–40	253	7	1	14.3±13.2	6	85.7±13.2	0	0.0±0.0
	40–50	302	17	1	5.9±5.7	15	88.2±7.8	1	5.9±5.7
	Over 50	124	5	0	0.0±0.0	5	100.0±0.0	0	0.0±0.0
	Total	1,301	48	3	6.3±3.5	44	91.7±3.9	1	2.1±2.1
The 5th–7th cc.	Subadults	320	3	1	33.3±27.2	2	66.7±27.2	0	0.0±0.0
	20–30	1,134	25	4	16.0±7.3	20	80.0±8.0	1	4.0±3.9
	30–40	753	38	8	21.1±6.6	28	73.7±7.1	2	5.3±3.6
	40–50	802	39	4	10.3±4.9	32	82.1±6.1	3	7.7±4.3
	Over 50	684	48	2	4.2±2.9	36	75.0±6.3	10	20.8±5.9
	Total	3,693	153	19	12.4±2.7	118	77.1±3.4	16	10.5±2.5
The 8th–12th cc.	Subadults	62	0	0	0.0±0.0	0	0.0±0.0	0	0.0±0.0
	20–30	393	1	1	100.0±0.0	0	0.0±0.0	0	0.0±0.0
	30–40	188	7	1	14.3±13.2	6	85.7±13.2	0	0.0±0.0
	40–50	301	13	0	0.0±0.0	13	100.0±0.0	0	0.0±0.0
	Over 50	102	1	0	0.0±0.0	1	100.0±0.0	0	0.0±0.0
	Total	1,046	22	2	9.1±6.1	20	90.9±6.1	0	0.0±0.0
The 2nd–12th cc.	Subadults	481	4	1	25.0±21.6	3	75.0±21.6	0	0.0±0.0
	20–30	2,050	44	6	13.6±5.2	37	84.1±5.5	1	2.3±2.3
	30–40	1,194	52	10	19.2±5.5	40	76.9±5.8	2	3.8±2.6
	40–50	1,405	69	5	7.2±3.1	60	87.0±4.0	4	5.8±2.8
	Over 50	910	54	2	3.7±2.6	42	77.8±5.6	10	18.5±5.3
	Total	6,040	223	24	10.8±2.1	182	81.6±2.6	17	7.6±1.8

TABLE 5. Degree of caries damage in the permanent dentition

Time period	Age (years)	Number of caries cavities	Superficial caries		Moderate caries		Deep caries		Periodontitis		Only dental roots preserved	
			n	%	n	%	n	%	n	%	n	%
The 2nd-5th cc.	x-20	1	0	0.00±0.0	1	100.0±0.0	0	0.00±0.0	0	0.00±0.0	0	0.00±0.0
	20-30	20	4	20.00±8.9	10	50.0±11.2	0	0.00±0.0	4	20.0±8.9	2	10.0±6.7
	30-40	8	1	12.5±11.7	2	25.0±15.3	0	0.00±0.0	4	50.0±17.7	1	12.5±11.7
	40-50	24	2	8.3±5.6	10	41.7±10.1	1	4.2±4.1	4	16.7±7.6	7	29.2±9.3
	Over 50	8	0	0.0±0.0	1	12.5±11.7	0	0.0±0.0	4	50.0±17.7	3	37.5±17.1
Total			7	11.5±4.1	24	39.3±6.3	1	1.6±1.6	16	26.2±5.6	13	21.3±5.2
The 5th-7th cc.	x-20	3	1	33.3±27.2	1	33.3±27.2	0	0.0±0.0	1	33.3±27.2	0	0.0±0.0
	20-30	27	7	25.9±8.4	6	22.2±7.9	2	7.4±5.0	10	37.0±9.3	2	7.4±5.0
	30-40	48	12	25.0±6.3	16	33.3±6.8	2	4.2±2.9	8	16.7±5.4	10	20.8±5.9
	40-50	49	4	8.2±3.9	17	34.7±6.8	4	8.2±3.9	14	20.6±6.5	10	20.4±5.8
	Over 50	66	6	9.1±2.4	23	34.8±5.9	3	4.5±2.6	16	24.2±5.3	18	27.3±5.5
Total			30	15.5±2.6	63	32.6±3.4	11	5.7±1.7	49	25.4±3.1	40	20.7±2.9
The 8th-12th cc.	x-20	0	—	—	—	0.0±0.0	—	100.0±0.0	—	0.0±0.0	—	0.0±0.0
	20-30	1	0	0.0±0.0	0	36.4±14.5	1	0.0±0.0	0	9.1±8.7	4	36.4±14.5
	30-40	11	2	18.2±11.6	4	64.3±12.8	0	7.1±6.9	1	21.4±10.9	1	7.1±6.9
	40-50	14	0	0.0±0.0	9	0.0±0.0	1	0.0±0.0	3	33.3±27.2	1	66.7±27.2
	Over 50	3	0	0.0±0.0	0	0.0±0.0	0	0.0±0.0	1	33.3±27.2	2	66.7±27.2
Total			2	6.9±4.7	13	44.8±9.3	2	6.9±4.7	5	17.2±7.0	7	24.1±7.9
The 2nd-12th cc.			39	13.8±2.1	100	35.3±2.8	14	4.9±1.3	70	24.7±2.6	60	21.1±2.4

the three time periods respectively) in the 1st millennium Lithuania (Table 5). Moderately deep caries was most frequent (35.3 %) with "dead teeth" (periodontitis and completely disintegrated tooth crowns) prevailing. The percentage of completely disintegrated tooth crowns (roots) increased rather consistently in older age groups, and, on the contrary, that of superficial caries decreased. According to a low frequency of deep caries (4.9 %), it is possible to suspect a chronic course of the disease in the 2nd—12th Lithuania. However, the predominance of periodontitis and disintegrated crowns (roots) testifies rather its acute course. In addition, the amount of intravital lost teeth (to all appearances, due to caries complications) was not small (578), and this fact shows that the caries course need not have been chronic in spite of a possible considerable resistance of the dental tissues in the 1st millennium.

The general intensity of cariotic process (ICP) and the intensity of cariotic process according to affected dental surfaces (CP_s) were checked on 67 skulls of young adults (18—30 years of age) with all teeth in both jaws preserved. The frequency of cariotic process was not low (28.4 %) in young adults, but its intensity was negligible and amounted to 0.3 (Table 6). Since no tooth with two or more caries cavities was registered in our materials, the indices ICP and CP_s are equal.

TABLE 6. Intensity of cariotic process in the 1st millennium Lithuania

Time period	Age (years)	Amount of skulls		Caries frequency		ICP	CP _s
		Investigated	Without caries	n	%		
The 2nd—5th cc.	18—30	12	10	2	16.7	0.4	0.4
The 5th—7th cc.	18—30	44	28	16	36.4	0.4	0.4
The 8th—12th cc.	18—30	11	10	1	9.1	0.1	0.1
The 2nd—12th cc.	18—30	67	48	19	28.4	0.3	0.3

In order to detect possible geographical differences in caries frequency, Lithuania's territory has been divided into separate regions according to archaeological cultures (the 2nd—5th cc.) and different Baltic tribe areas (the 5th—12th cc.). The principles of this division can be found in the first part of the present paper. The lowest cariosity was found in the territory of the Žemgaliai and Seliiai (or Semigalians and Selians, North Lithuania) in the 5th—7th and

the 8th—12th cc. (Table 7). No other territorial differences in caries epidemiology were found.

The percentage of bite anomalies was 19.8 ± 3.9 % in the 1st millennium Lithuania. Tooth diseases of non-carious origin were rather rare: only two cases (0.8 ± 0.6 %) of generalized enamel hypoplasia were registered. It is believed that enamel hypoplasia of deciduous dentition is a consequence of the 20th c., nevertheless one case of the disease was diagnosed in deciduous teeth in our materials. D. C. Cook and J. E. Buikstra (1979) found 83 cases of circular caries, or enamel hypoplasia, in the sample of 170 skulls of children (under 6 years of age) from the 1st c. B.C. — the 5th cc. A.D. Maybe it occurred due to some local reasons.

Parodontosis was a rather widespread disease in the 2nd—12th cc. Lithuania, as it was in other European countries — in Poland (Malinowski A., Wypych B., 1966, Malinowski A., 1979), Bulgaria (Boev P., Maslinkov D., 1965) and France (Ménard J., 1978). The general frequency of the disease was as high as 53.9 % (Table 8), though tartar was not common at the same time (33.9 %). The 1st degree of the disease was diagnosed most often in all age groups, and the percentage of its terminal stage was rather low (3.2 %). It is to be supposed that the course of this widespread disease was chronic with its dystrophic form predominating in the 1st millennium Lithuania, for the amount of tartar, localized above and under the gum, was small (13.8 %).

As regards more serious pathology of the masticatory apparatus, two cases of odontogenic cysts were found. One of them (1×1 cm) was localized at the teeth 24—25, and the other (2×2.5 cm) was found at the root of the tooth 16. In addition, the granulomatous periodontitis with fistules was diagnosed in 65 teeth (1.16 ± 0.1 %) of all investigated teeth of adults (over 20 years of age). Periodontic changes and "dead tooth" occurred due to dental attrition in 32 out of 65 cases (0.6 ± 0.1 %) of periodontitis. The loss of all teeth (a "toothless mouth") was found in 0.3 ± 0.3 % of investigated skulls of adult persons.

CONCLUSIONS

1. The incidence of caries was high and the intensity of cariotic process was very small in the 1st millennium A.D. Lithuania.
2. The molars were the most frequently affected teeth with caries.
3. Upper teeth were affected more often than the lower ones.
4. Sexual dimorphism of cariosity was insignificant, nevertheless females were affected a little more often.
5. The majority of caries cavities were situated on the approximal dental surfaces.
6. Deep caries was the most rare, and periodontitis was most frequent at that time.

TABLE 7. *Geographical variations in caries frequency*

Archaeological culture or tribe	Caries in different age groups											
	Non-adults			20—30 Y.			30—40 Y.			40—50 Y.		
	N	n	%	N	n	%	N	n	%	N	n	%
The 2nd—5th cc.												
Burial grounds	99	1	1.0 ±1.0	333	18	5.4 ±1.2	174	6	3.4 ±1.4	211	13	6.2 ±1.7
Burial mounds	0	—	—	190	0	0.0 ±0.0	79	2	2.5 ±1.8	91	11	12.1 ±3.4
Total	99	1	1.0 ±1.0	523	18	3.4 ±0.8	253	8	3.2 ±1.1	302	24	7.9 ±1.6
The 5th—7th cc.												
Aukštaičiai	182	2	1.1 ±0.8	300	11	3.7 ±1.1	335	34	10.1 ±1.6	38	27	7.1 ±3
Žemaičiai	138	1	0.7 ±0.7	754	16	2.1 ±0.5	428	13	3.1 ±0.8	41	20	4.8 ±1.1
Žemgaliai-Sėliai	0	—	—	80	0	0.0 ±0.0	0	—	—	0	—	—
Total	320	3	0.9 ±0.5	1,134	27	2.4 ±0.5	753	47	6.2 ±0.9	802	47	5.9 ±0.8
The 8th—12th cc.												
Aukštaičiai	0	—	—	0	—	—	31	1	3.2 ±3.2	14	1	7.1 ±6.9
Žemaičiai	0	—	—	149	1	0.7 ±0.7	46	8	17.4 ±5.6	118	1	0.8 ±0.8
Žemgaliai-Sėliai	62	0	0.0 ±0.0	244	0	0.0 ±0.0	111	2	1.8 ±1.3	169	12	7.1 ±1.9
Total	62	0	0.0 ±0.0	393	1	0.3 ±0.3	138	11	5.9 ±1.7	301	14	4.7 ±1.2
Total	481	4	0.8 ±0.4	2,050	46	2.2 ±0.3	1,194	66	5.5 ±0.7	1,405	85	6.0 ±0.6
										910	75	8.2 ±0.9
										6,040	276	4.6 ±0.3

TABLE 8. *Parodontosis frequency in the 2nd—12th cc. Lithuania*

Time period	Age (years)	N	Alveolar atrophy						Tartars									
			I°		II°		III°		Total		Over gum		Over and under gum		Total		Absent	
			n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
The 2nd—5th cc.	x—20	4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	25.0	1	25.0	3	75.0
	20—30	11	2	18.2	0	0.0	0	0.0	2	18.2	0	0.0	1	9.1	1	9.1	10	90.9
	30—40	7	5	71.4	1	14.3	0	0.0	6	85.7	1	14.3	2	28.6	3	42.9	4	57.1
	40—50	5	4	80.0	0	0.0	0	0.0	4	80.0	2	40.0	0	0.0	2	40.0	3	60.0
	Over 50	2	1	50.0	1	50.0	0	0.0	2	100.0	1	50.0	1	50.0	2	100.0	0	0.0
Total		29	12	41.4 ±9.1	2	6.9 ±4.7	0	0.0	14	48.3 ±9.3	4	13.8 ±6.4	5	17.2 ±7.0	9	31.0 ±8.6	20	68.9 ±8.6
The 5th—7th cc.	x—20	9	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	0	0.0	1	11.1	8	88.9
	20—30	38	10	26.3	1	2.6	0	0.0	11	28.9	10	26.3	3	7.9	13	34.2	25	65.8
	30—40	26	10	38.5	4	15.4	0	0.0	14	53.8	8	30.8	2	7.7	10	38.5	16	61.5
	40—50	29	14	48.3	7	24.1	1	3.4	22	75.9	6	20.7	4	13.8	10	34.5	19	65.5
	Over 50	26	10	38.5	11	42.3	4	15.4	5	96.2	5	19.2	11	42.3	16	61.5	10	38.5
Total		128	44	34.4 ±4.2	23	17.9 ±3.4	5	3.9 ±1.7	72	56.3 ±4.4	30	23.4 ±3.7	20	15.6 ±3.2	50	39.1 ±4.3	78	60.9 ±4.3
The 8th—12th cc.	x—20	2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	100.0
	20—30	13	1	7.7	0	0.0	0	0.0	1	7.7	1	7.7	0	0.0	1	7.7	12	92.3
	30—40	6	3	50.0	2	33.3	1	16.7	6	100.0	1	16.7	1	16.7	2	33.3	4	66.7
	40—50	8	4	50.0	2	25.0	0	0.0	6	75.0	1	12.5	0	0.0	1	12.5	7	87.5
	Over 50	3	2	66.7	1	33.3	0	0.0	3	100.0	1	33.3	0	0.0	1	33.3	2	66.7
Total		32	10	31.3 ±8.2	5	15.6 ±6.4	1	3.1 ±3.1	16	50.0 ±8.8	4	12.5 ±5.8	1	3.1 ±3.1	5	15.6 ±6.4	27	84.4 ±6.4
Total		189	66	34.9 ±3.5	30	15.9 ±2.7	6	3.2 ±1.3	102	53.9 ±3.6	38	20.1 ±2.9	26	13.8 ±2.5	64	33.9 ±3.4	125	66.1 ±3.4

7. The lowest cariosity was characteristic of North Lithuania's inhabitants (the Žemgaliai and the Sėliai).

8. Parodontosis was a rather widespread dental disease, and it developed from 20 years of age.

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