INDIAN AND ESKIMO METABOLISMS

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During the summer of 1937 members of the Cleveland Clinic Expedition to northeastern Canada and the subarctic regions of Churchill Bay and Chesterfield Inlet made a series of metabolism studies on thirteen Chippewa Indians living on a reservation near Churchill and on sixty-three Eskimos living in the vicinity of Chesterfield Inlet. Six of the Indians were males and seven were females; of the Eskimos, thirty were males and thirty-three were females. A number of the tests included here were made by Dr. Thomas Melling, Medical Health Officer for the District of Keewatin, Canada, who has his headquarters at Chesterfield. After having been instructed in the use of our Jones metabolism apparatus he carried on many of the tests on the Eskimos.

In each instance a short preliminary test was made with the individual undergoing the test presumably under basal conditions. Following this, the next test was recorded and it is this record in every case which is represented in our metabolism data. The individuals tested were instructed to eat no food following their evening meal on the day prior to the test. From the appearance of the Indians' tents on the morning of the test plus their apparent willingness to cooperate with us induced in part, perhaps, by the promise of small presents, we believe that they obeyed this injunction against taking food. Doctor Melling followed this same general procedure with the Eskimo subjects and found no difficulty in securing their cooperation. Besides this, he is well known to them and enjoys their confidence. Since the matter of having

meals at a set time is of no great moment to either Indian or Eskimo, this request to forego breakfast combined with an admonition to rest prior to the test, involved no hardship for the subjects of the test.

BASAL METABOLISM TESTS ON CHIPPEWA INDIANS

The tests upon the Chippewa Indians were carried out on warm, sunshiny days in early August. The tests were made upon a wide bench in the open, but sheltered from the wind. Before the test the individuals reclined in their tents and remained so until called for the tests.

A word might be said with reference to the habits of the Chippewa Indian in this region. He lives in tents the year around, he does a little hunting and fishing and counts on the Canadian Government for support in the event that his own efforts fail to provide him with sufficient food and clothing to maintain himself. Apparently he makes less effort to fend against the inhospitable climate than does the Eskimo, and he does not show the same adaption to the rigors of northern life as does the Eskimo. His food consists of fish and game, eked out with 'store' food where he can procure it.

Table 1 sets forth the data as secured on the Indian males and females. Included in these data are age, weight, height, as well as blood pressure, temperature, pulse rate and metabolism percentage based upon the Mayo normal standard records as established for white individuals of corresponding age, sex and body size.

METABOLISM

Disregarding the values over +40 in the male as well as in the females, the average metabolic values are +18% for the male Chippewa Indian and +18.50% for the female Chippewa Indians. These values we believe to be approximate basal values for this group.

PULSE AND BLOOD PRESSURE

We were surprised at the slow pulse rate in the Indian. This ran significantly lower than did the pulse rate of the

Eskimo. The average pulse rate for the Indian males was 53.3 against 70 for the male Eskimo and 63 for thirty-five Maya-Quiché Indian males whose records were secured in Guatemala. In the female Indian the average pulse rate was 65 as compared with 78.8 for the Eskimo female and 82 for five

TABLE 1

Chippewa Indians

Males

NUMBER	AGE	HEIGHT	WEIGHT	TEMPERATURE	BLOOD PRESSURE		PULSE	O_2 CONSUMED PER MINUTE	DEVIATION FROM MAYO NORMAL STANDARD
	Years	*cm.*	*kg.*	*F.*	*Sys.*	*Dias.*		*cc.*	%
1	21	163.8	61.2	96.8	112	78	55	258	12[1]
2	40	176.9	70.3	97.0	102	75	42	...	..
3	33	170.8	60.3	97.0	128	85	48	250	9
4	28	166.4	60.3	96.5	118	78	56	266	16
5	24	166.4	63.0	96.3	134	80	62	320	35
6	30	168.9	65.8	95.8	126	85	58	333	44
Av.	29	168.8	63.4	96.9	120	80	53.3	273	+18.0 without no. 6
				Female	Indians				
7	15	157.5	48.5	98.0	122	74	52	216	5
8	17	158.7	54.9	97.8	116	72	62	333	64
9	50	166.4	68.5	97.2	120	70	72	253	23
10	33	160.0	60.3	97.4	145	86	60	266	39
11	50	151.8	61.7	98.4	114	72	78	210	8
12	30	152.3	58.9	97.0	128	78	54	235	22
13	33	157.4	66.2	97.4	126	76	78	235	14
Av.	33	157.7	59.8	97.6	124	75	65	236	+18.5 without no. 8

[1] All values in final column are 'plus' unless otherwise indicated.

Maya-Quiché Indian females. The pulse of these northern Indians is characterized by the fullness, and regularity of the beat.

The blood pressure of the Chippewa Indians averaged 120/80 for the males and 124/75 in the females as against 119/75

for the Eskimo males and 112/72 in the Eskimo female compared with 111/77 for thirty Maya-Quiché Indian males and 111/75 for five Maya-Quiché females in a series of tests made in Guatemala, C. A.

Considering the nomadic habits of these northern Chippewa Indians, their extreme endurance, which in many instances rivals or exceeds that of the Eskimo in the sense that they face the extreme rigors of the climate and yet fail to provide the warm shelters for themselves as do the Eskimos, and by their failure to clothe themselves as warmly as do the Eskimos either in summer or in winter, the relatively high metabolic rate might be explicable on these grounds. Considering the effect of environmental temperature upon the basal metabolic rate, any continued exposure to the prevailing temperatures at the latitude of Churchill, which marks the northern limit of the Indian, might be expected to raise this rate significantly. On the other hand, the Maya-Quiché Indian of Central America according to our own findings and those of Steggerda, Williams, Shattuck, Benedict, the Navajo Indian of Arizona according to Salsbury, all tend to show a basal metabolic rate significantly higher than the standard estimates for whites of similar ages and weights. It is evident that this higher basal rate is not a Mongolid characteristic since the studies of MacLeod, Crofts and Benedict, Knipping, Takahira, all show the southern Mongolid types (the Sinid and the Palaeomongolid) run a lower basal metabolic rate than do the Indians or the Eskimos measured on this continent which presumably are an offshoot of the North mongolid or Tungid type of the human race.

BASAL METABOLISM TESTS ON ESKIMOS

The Eskimos represented in this study live almost entirely on a native diet according to Doctor Melling. Their food consists of caribou, seal, walrus, fish and birds. They still live in caribou skin or canvas tents in summer and snow huts in the winter.

Table 2 represents the data secured from thirty male Eskimos between the ages of 15 and 85 years with an average age of 36.8 years. The average nude weight of these Eskimos was 64.9 kg., or approximately the same as prevails for male whites in the United States. The average male height of 5 feet 5 inches is somewhat under the white average.

TABLE 2

Eskimo males

NUMBER	AGE	HEIGHT	WEIGHT	TEMPERATURE	BLOOD PRESSURE		PULSE		O_2 CONSUMED PER MINUTE	DEVIATION FROM MAYO NORMAL STANDARD
	Years	*cm.*	*kg.*	*F.*	*Sys.*	*Dias.*	*Bef.*	*Aft.*	*cc.*	%
14	47	165.1	72.5	97.4	118	86	54	66	250	8[1]
15	85	161.3	57.6	97.0	92	70	67	84	206	8
16	40	170.2	72.5	97.0	138	80	72	60	308	27
17	18	155.0	75.2	96.4	122	78	66	84	286	24
18	22	170.2	63.9	98.0	148	80	72	84	286	17
19	28	155.0	58.1	98.3	116	72	64	62	235	9
20	30	160.0	67.1	96.6	124	70	64	70	242	5
21	37	157.4	66.7	96.3	162	90	62	68	286	29
22	40	157.4	58.1	96.3	108	64	60	60	235	13
23	70	172.1	73.5	96.3	112	70	68	64	250	11
24	50	158.1	62.1	96.1	122	70	80	78	285	35
25	65	167.7	64.4	96.0	120	60	78	72	235	13
26	15	153.7	48.5	96.3	120	65	72	80	242	4
27	30	158.8	50.8	97.4	112	78	60	56	266	18
28	64	165.1	75.7	97.0	120	84	66	60	333	42
29	50	165.1	77.1	96.0	114	78	60	68	258	9
30	55	161.3	61.7	96.2	138	98	80	76	258	21
31	22	157.7	58.9	98.1	102	68	72	72	242	8
32	24	163.8	63.0	98.0	104	68	80	80	273	16
33	45	175.2	78.0	97.3	116	78	72	56	286	14
34	55	165.1	72.1	96.4	102	68	60	56	250	12
35	25	159.4	64.4	97.6	138	86	60	60	273	18
36	35	171.5	72.1	96.0	118	84	76	60	266	7
37	28	166.3	75.3	97.1	126	88	76	76	286	14
38	40	158.1	58.5	97.1	128	78	72	72	250	21
39	18	157.5	46.3	97.3	96	78	80	80	242	18
40	18	160.7	54.9	96.8	116	62	64	64	250	8
41	38	160.0	71.2	96.6	108	60	56	64	286	23
42	38	171.5	78.5	96.0	122	78	60	60	363	42
43	18	160.0	60.3	96.0	102	64	72	72	235	−3
Av.	38.3	162.7	65.3	96.8	118.8	75.1	61.9	68.8	265.3	+14.5 without +42 values; +16.4 including all values

[1] All values in final column are 'plus' unless otherwise indicated.

TABLE 3

Eskimo females

NUMBER	AGE	HEIGHT	WEIGHT	TEMPERATURE	BLOOD PRESSURE		PULSE		O_2 CONSUMED PER MINUTE	DEVIATION FROM MAYO NORMAL STANDARD
	Years	*cm.*	*kg.*	*F.*	*Sys.*	*Dias.*	*Bef.*	*Aft.*	*cc.*	%
44	47	152.4	58.9	97.0	124	80	66	66	266	42[1]
45	18	148.5	51.3	98.0	122	78	90	84	235	29
46	16	147.9	53.1	98.0	126	80	72	90	286	45
47	21	151.1	55.8	98.1	128	78	72	78	258	38
48	42	153.7	56.6	98.3	98	68	96	84	258	43
49	56	154.9	57.2	97.2	124	72	84	66	222	26
50	17	144.7	45.8	97.2	104	68	60	72	216	23
51	16	138.4	44.4	98.5	114	72	58	74	308	76
52	38	149.8	55.3	97.5	125	78	70	80	205	12
53	50	152.4	61.0	96.1	120	68	76	68	250	35
54	45	150.4	55.3	97.3	108	70	80	76	195	8
55	45	158.1	54.0	95.5	118	78	80	76	205	11
56	16	154.9	52.2	97.3	108	68	92	96	222	10
57	35	153.0	54.0	96.1	136	80	84	92	258	40
58	18	161.3	46.7	97.0	102	70	88	84	222	19
59	22	156.2	66.7	97.0	124	88	84	84	258	25
60	55	151.1	53.1	97.0	130	86	80	84	222	31
61	45	140.9	51.3	98.1	138	80	76	84	235	40
62	40	151.1	58.9	98.1	108	74	64	76	286	51
63	20	148.5	53.1	97.0	108	64	76	80	222	23
64	18	158.1	59.4	97.0	108	68	84	80	206	0
65	45	143.5	50.3	97.0	112	66	64	76	266	58
66	18	157.3	67.0	97.4	116	70	76	88	235	9
67	27	146.7	55.8	96.2	110	72	80	76	222	23
68	35	152.4	61.2	98.3	110	70	100	104	242	23
69	45	160.6	57.6	98.0	88	68	68	68	222	20
70	22	163.2	58.5	96.4	90	70	76	80	348	70
71	16	151.1	48.5	97.8	96	68	92	92	216	13
72	19	147.0	59.9	97.0	102	58	64	52	222	15
73	30	151.1	49.0	96.3	98	64	64	84	222	26
74	40	152.4	54.1	98.6	104	68	92	96	235	29
75	20	148.5	55.3	98.1	118	64	96	116	235	27
76	40	147.9	56.2	97.2	94	60	108	100	242	31
Av.	31.4	151.5	55.1	97.3	112.1	71.7	78.8	82.4	240.5	+21.12 without 40 or over values; +29.4 including all values

[1] All values in final column are 'plus' unless otherwise indicated.

The average basal metabolic rate for these male Eskimos excluding values over +40 was +14.5. Including all values the average was +16.4.

Table 3 shows the data secured from thirty-three female Eskimos. The age range in this group was from 16 to 65 years with an average age of 32.4 years. The average nude weight of the group was 55 kg. or just about the average for American female whites.

The average metabolic rate recorded for the entire group of female Eskimos was +29.4. Omitting all values of +40 or over the average values of the remaining 24 individuals was +21.12.

TABLE 4

GROUP MALE AND FEMALE	MEAN METABOLISM PER CENT + B. M. R.	STANDARD DEVIATION	COEFFICIENT OF VARIATION PER CENT
Male and female Indians	18.25±3.46	10.90±2.55	58.8±10.31
Male Eskimos	14.50±1.62	8.50±1.13	58.46± 7.81
Female Eskimos	21.12±1.76	8.65±1.25	38.41± 5.54

PULSE AND BLOOD PRESSURE

The pulse rate of the male Eskimo, 63 to 69 as well as that of the female at 79 to 83 falls perhaps slightly under the pulse values of white males and females and is markedly higher than that of the Chippewa Indians.

The average blood pressure for the males was 119 systolic, 75 diastolic and for the females it ran 112 systolic and 71 diastolic. The average height of 5 feet ½ inch appears to be considerably lower than the white female average.

SUMMARY

Metabolism tests were made on six male and seven female Chippewa Indians. The average metabolic values recorded for the males was +18.0% for the females it was +18.5%. Pulse rate and blood pressure both appear to be lower than they are for the American white population or the Eskimo, or Mayan Indian of Central America.

The metabolism tests run on thirty male Eskimos from the region around Chesterfield Inlet, Canada, gave an average reading of +16.4% for the males and +29.0% for thirty-three females when the values above +40 are included; without the values above +40% the averages for the males are +14.5% and for the females they are +21.12%. The blood pressure for both the males and the females is lower than that of whites of corresponding age, the pulse rate corresponds rather closely to that of white individuals.

LITERATURE CITED

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