On Certain Dental Characters of the Eskimo of the Eastern Canadian Arctic

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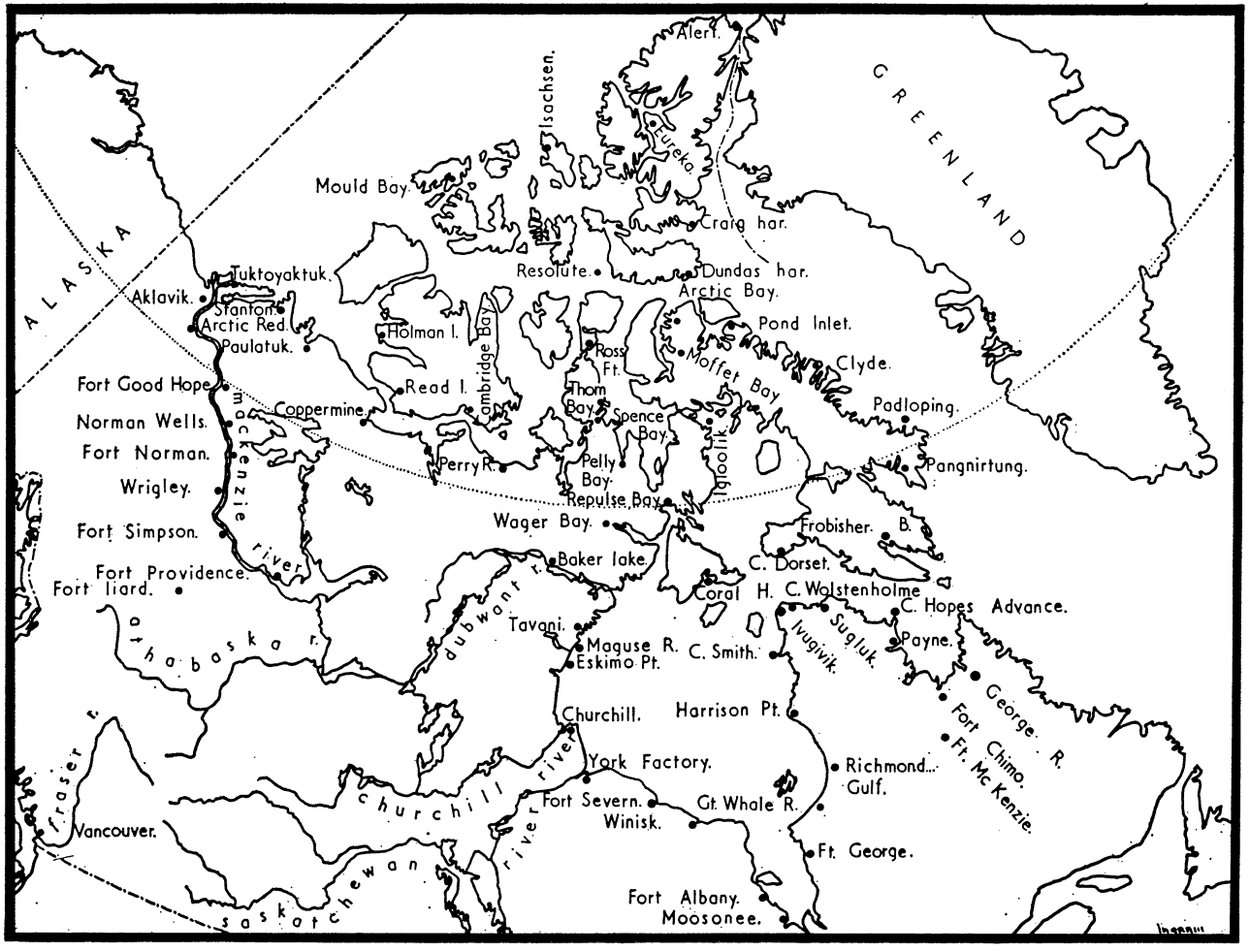
The data below have been gathered during the months July, August, and September 1959 on the Canadian Research Ship C.D. Howe on a cruise in the Eastern Canadian Arctic. The Eskimos of the following settlements were visited: 1) Wakeham Bay, 2) Sugluk, 3) Ivugivik, 4) Coral Harbour (Southampton Island), 5) Cape Dorset, 6) Lake Harbour, 7) Frobisher Bay, 8) Brevoort Island, 9) Pangnirtung, 10) Broughton Island, 11) Padloping Island, 12) Kivitoo, 13) Clyde River, 14) Pond Inlet, 15) Arctic Bay, 16) Resolute, 17) Grise Fjord.

The most detailed studies of the dentition of Eskimos and related people have been done in Greenland and the Aleutian Islands while the Eastern Arctic remains terra incognita from the physical anthropological and odontological points of view. The authors were of the opinion that it would be interesting and important to study the incidence of shovel-shaped incisors, and certain aspects of maxillary lateral incisor crowding, to compare these data with the results of the above mentioned studies. Since these characters are polygenetically determined they are less subject to rapid change by such processes as genetic drift which always plays havoc with the distribution of monogenetic traits in small populations.

The dentition of mongloid peoples as a group and Eskimos in particular is characterized by a high incidence of shovel-shaped incisors, a low incidence of Carabelli's cusp, a high frequency of mandibular torus, a high frequency of an edge occlusion of the incisors and a frequent absence of third molars.

Hrdlicka in 1911 although he did not invent the term "shovel-shape" was the first to point out that this character was


ALASKA
GREENLAND
Alert.
Ellesmere I.
Eureka
Craig har.
Mould Bay.
Resolute.
Dundas har.
Arctic Bay.
Pond Inlet.
Clyde.
Padloping.
Pangnirtung.
Tuktoyaktuk.
Aklavik.
Stanton.
Arctic Red.
Paulatuk.
Holman I.
Ombridge Bay
Ross Ft.
Moffet Bay
Thom Bay
Spence Bay.
Igloolik.
Fort Good Hope
Norman Wells.
Fort Norman.
Wrigley.
Fort Simpson.
Fort Providence.
Fort liard.
mackenzie river
Coppermine.
Read I.
Perry R.
Pelly Bay.
Repulse Bay.
Wager Bay.
Baker lake.
Frobisher. B.
C. Dorset.
Coral H.
C. Wolstenholme
C. Hopes Advance.
Payne.
Sugluk.
Ivugivik.
C. Smith.
Harrison Pt.
Churchill.
Tavani.
Maguse R.
Eskimo Pt.
dubwant r.
athabaska r.
fraser r.
churchill river
York Factory.
Fort Severn.
Winisk.
Gt. Whale R.
Richmond Gulf.
George R.
Fort Chimo.
Ft. Mc Kenzie.
Ft. George.
Fort Albany.
Moosonee.
Vancouver.
saskatchewan r.

frequent among American Indians as well as Chinese, Japanese, and other Mongloids. He also showed that Whites and Negros had a very low frequency for this trait. Other investigators have demonstrated that shovel-shaped incisors are present in early hominids, e.g., sinanthropus, among anthropoids, certain old-world monkeys, Icelandic Nordics, and Australoids. However the major evidence clearly indicates that shovel-shaped incisors are for the most part a mongloid feature.

Hrdlicka set up a subjective scale to denote the extent of shovel-shape which is as follows:

Shovel	— the enamel rim with the enclosed fossa well developed.
Semi-shovel	— the enamel rim was distinct but the enclosed fossa is shallow.
Trace shovel	— distinct traces of the enamel rim but which could not be classed as yet as semi-shovel.
No shovel	— no perceptible trace of rim and fossa or in which traces of these were so faint or imperfect as not to deserve special characterization.

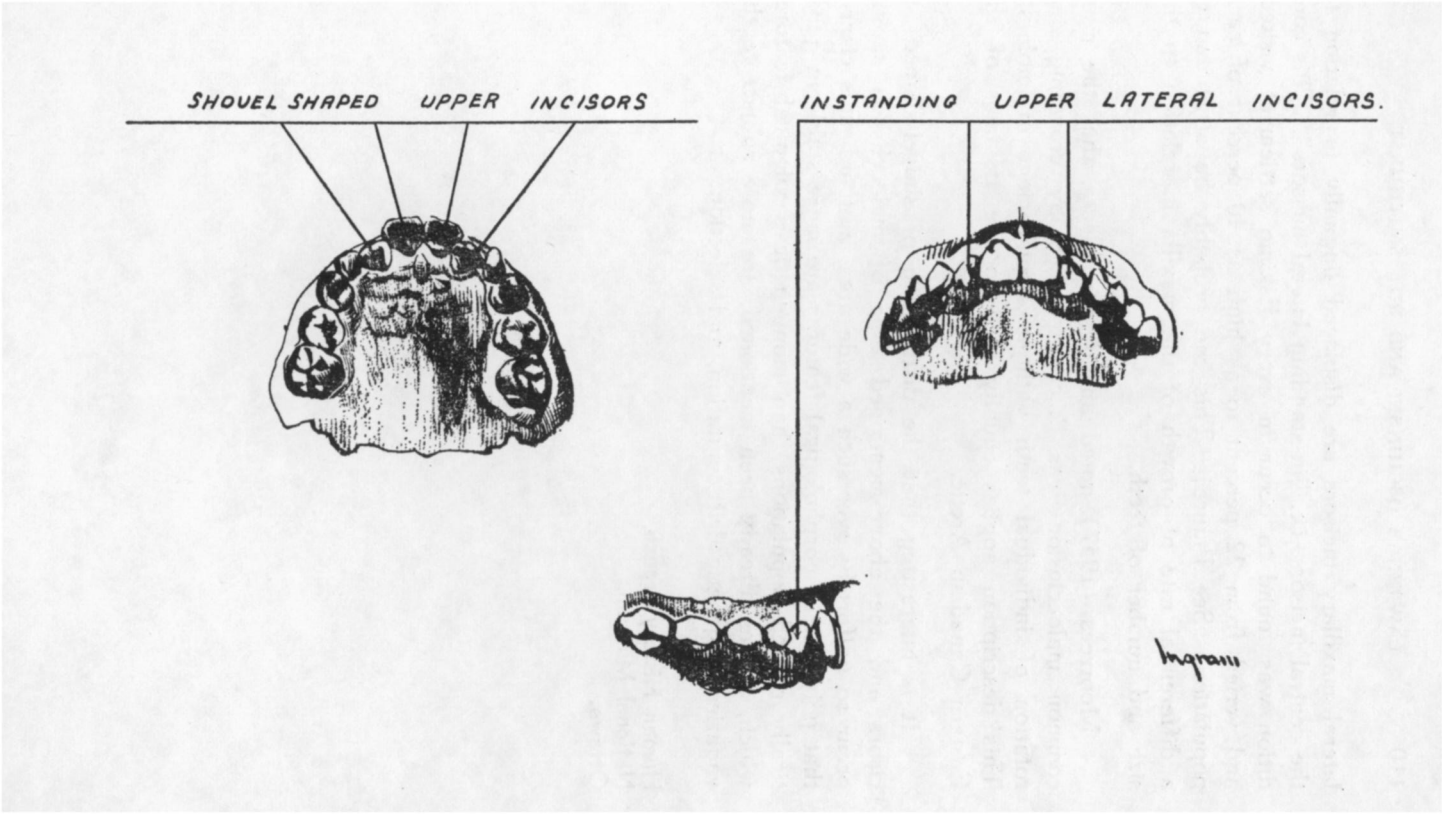
The data of the present study were graded according to the above scale but will not be presented in this detail for the time being. The authors have lumped the first three categories of Hrdlicka in order to compare their data more easily with those of other authors using different scales. As can be seen in the table below the Canadian Eskimos agree with the Greenland and Aleut data but are rather different from Hrdlicka's Eskimo series. This is probably more a discrepancy caused by different subjective methods of appraisal rather than anything else. Perhaps the metrical method of Dahlberg and Mikkelsen is to be preferred to avoid the pitfalls of various individual points of view based upon superficial description.

As has already been mentioned above, the most frequent occlusal type concerning the relationship of the incisors is an edge-to-edge or labidodont condition. Overbite or scissor bite occurred in only .4 percent of the sample. Protrusive mandible or Class 3 malocclusion, according to Angle's classification, also occurred in .2 percent. In approximately 33 percent of a sample of 2,000 Canadian Eskimos a situation obtains wherein the

Percentage Frequency of Shovel-Shaped Incisors *
Median Incisors

Group	*Author*		*Number of Individuals*	*Total of marked and semi-shoveled*	*Trace*	*None*
Canadian Eskimo	Oschinsky and Smithurst		499	99.2	0	0.8
Aleuts	Moorrees	'57	75	97.3	2.7	0
Eskimo	Hrdlicka	'20	40	84.0	15.0	
East Greenland Eskimo	Pederson	'49	116	95.3		
Mixed Indians	Wissler	'31	male 1388	85.0		
Pima Indians	Dahlberg		male 101	96.0	4.0	
Pueblo Indians	Dahlberg		21	100.0	0.0	
Sioux	Hrdlicka	'31	116	98.3	1.7	
Pecos Pueblos	Nelson	'37	324	89.5	8.3	2.2
Pecos Pueblos	Hooten	'30	124	86.3	13.7	
Early Texas Indian	Goldstein	'48	124	95.1	4.9	
Indian Knoll	Dahlberg and Snow	'	30	100.0		
Chinese	Hrdlicka	'20	male 1094	89.6	1.8	7.8
Mongolian	Hrdlicka	'20	24	91.5	8.5	
American Negro	Hrdlicka	'20	male 618	12.5	33.0	54.5
American White	Hrdlicka	'20	male 1000	9.0	24.5	66.5

* Modified from Dahlberg, 1951, "The Dentition of the American Indian" in The Physical Anthropology of the American Indian (Ed. W.S. Laughlin).


SHOVEL SHAPED UPPER INCISORS
INSTANDING UPPER LATERAL INCISORS.
Ingram

lateral maxillary incisors are displaced lingually in relation to the central incisors. i.e. "in-standing lateral incisors". This condition was found to occur in every Eskimo settlement visited, and veried from 22 percent to as high as 40 percent of each population. (See Figure). This can probably be attributed to a differential rate of growth of the maxilla in relation to the size and number of teeth.

Moorrees (1957) noted among the Aleuts, that the most common malocclusion was "...characterized by crowding and rotation of individual teeth without displacement of molars." This description applies equally well to the Eskimos of the Eastern Canadian Arctic.

It is interesting that the distribution of shovel-shaped incisors and the above-mentioned type of malocclusion should occur so uniformly over such a wide area, and indicates clearly that polygenetic morphological features are more stable in genetically related populations than mongenetic serological features which, as has already been mentioned, are more subject to the vagaries of genetic drift, mutation, and selection.

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BIBLIOGRAPHY

ADLOFF, P., "Art und Rassenmarkmale im Gebiss der fossilen Menschen." *Zeitschr. f. Rassenkunde,* Vol. 3, No. 1 (1936), pp. 10-26.

BOLK, L., "Das Carabellische Hockerchen. Schweiz." *Vierteljhrsschr. f. Zahnheilk* 25: H. 2 (1915).

— "Problems of Human Dentition." *Am. J. Anatomy,* 19 (January, 1916). pp. 91-148.

DAHLBERG, A.A., "Inherited Congenital Absence of Six Incisors, Deciduous and Permanent." *J.D. Res.,* 16 (February, 1937), pp. 59.

— "The Changing Dentition of Man." *Jnl. of A.D.A.,* Vol. 32 (June, 1945), pp. 676-690.

— "The Dentition of the American Indian." in *The Physical Anthropology of the American Indian* (The Viking Fund. New York, 1951).

— "The Evolutionary Signifiance of the Protostylid." *Amer. J. Phys. Anthrop.,* Vol. 8, N.S. No. 1 (March, 1950).

DAHLBERG, A.A., and MIKKELSEN, Oscar, "The Shovel-Shaped Character in the Teeth of the Pima Indians." *Proceedings of the 16th Annual Meeting, A.A.P.A., J. Phys. Anthrop.,* N.S., Vol. 5, No. 2 (June, 1947).

DRENNAN, M.R., "The Dentition of a Bushman Tribe." *Annals of the South African Museum,* 24: pt. 1.

GOLDSTEIN, M.S., "Congenital Absence and Impaction of the third molar in the Eskimo mandible." *Am. J. Phys. Anthrop.,* Vol. 16, No. 3 (1932).

— "Dentition of Indian Crania from Texas." *Am. J. Phys. Anthrop.,* N.S., Vol. 6, No. 1 (1948).

GREGORY, W.K., and HELLMAN, Milo, "The Dentition of Dryopithecus and the origin of Man." *Anthropol. Papers of the A.M.N.H.,* 28, Part. 1 (New York, 1927).

HELLMAN, Milo, "Racial Characters in Human Dentition." *Proc. Amer. Philos. Soc.,* 67, No. 2 (February, 1928), pp. 157-174.

— "Wisdom Teeth in Lower Jaw." *Arch. Clin. Oral Path.,* 4 (Sept.-Dec., 1940), pp. 171-186.

HIRSKAWA, W., "Beitrag zur Kenntnis uber das Tuberculum Carabelli bei Japanern." *Shika Gp.,* 18 (1938), 437.

HRDLICKA, Ales, "Shovel-Shaped Teeth." *Am. J. Phys. Anthrop.,* 3 (1920), 429-465.

— "Further Studies on Tooth Morphology." *Am. J. Phys. Anthrop.,* 4 (1921), 141-176.

MOORREES, C.F.A., "The Dentition as a Criterion of race with special reference to the Aleut." *J. Dental Research,* 30 (1951), 815-821.

MOORREES, C.F.A., OSBORNE, and WILDE, E., "Torus mandibularis: its occurrenre in Aleut children and it genetic determinants." *Am. J. Phys. Anthrop.,* N.S., 10 (1952), pp. 319-329.

MOORREES, C.F.A., and REED, R.B., "Biometrics of crowding and spacing of the teeth in the mandible." *Am. J. Phys. Anthrop.,* N.S., 12 (1954), pp. 77-78.

MOORREES, C.F.A., THOMSEN, S., JENSEN, E., and YEN, P.K., "Mesiodistal crown diameters of the deciduous and permanent teeth in individuals." *J. Dental Research,* 36 (1957), pp. 39-47.

MOORREES, C.F.A., The Aleut Dentition" (Summary). *Tijdschr. Tandheelk.* 64 (1957), pp. 161-171.

— *The Aleut Dentition.* (Harvard University Press, 1957).

MUHLREITER, E., *Anatomie des menschlichen Gebisses* (Arthur Felix, Leipzig; 5th ed.).

NELSON, C.T., "The Teeth of Indians of Pecos Pueblo." *Am. J. Phys. Anthrop.,* 23 (1937), pp. 261-293.

OSHIMA, S., "Dental Anomalies of the Chinese." *Jour. Orient. Med.,* 26: No. 6, (1938).

PEDERSEN, P.O., "The East Greenland Eskimo Dentition." *Medelelser om Grønland,* Vol. 142. Bianco Lunos Bogtrykkeri (Copenhagen, 1949).

PEDERSEN, P.O., and HINSCH, E., "Numerical Variations in Greenland Eskimo Dentition." *Acta Scandinavica,* 1 (1940), pp. 93-134.

RITCHIE, S.G., "The Dentition of the Western and Central Eskimos." *Report of the Canadian Arctic Expedition 1913-18.* Vol. 12,

SHAW, J.C. Middleton, *The Teeth, the Bony Palate and the Mandible in Bantu Races of South Africa* (London. John Bale, Sons and Danielsson, 1931).

SCHULTZ, A.H., "Inherited Reductions in the Dentition of Man." *Human Biology,* 6 (1934), pp. 627-631.

WEIDENREICH, F. "Dentition of Sinanthropus Pekinensis: Comparative Odontography of Hominids." *Paleontol. Sinica,* No. 1 (1937).

— "Giant Early Man From Java and South China." *Anthropological Papers of the Amer. Museum of Natural History.* Vol. 40, part. 1 (1945).

WISSLER, Clark, "Observations on the Face and Teeth of the North American Indians." *Anthropol. Papers of the M.N.H.,* Vol. 33, Part. (1931).