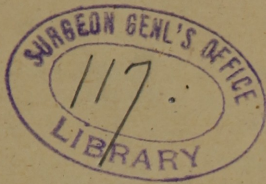


MORTON (S.G.)

Notes on hybridity (2^d letter)



Morton (S. G.)

SECOND LETTER.

Notes on Hybridity, designed as a further Supplement to a Memoir on that subject in a former number of this Journal. By SAMUEL GEORGE MORTON, M. D. Being a Second Letter to the Editors of the Charleston Med. Journ. and Review.

GENTLEMEN.—I. In my last paper, I adduced the detailed experiments of Hellenius to prove, what I had before merely alluded to, the fertile hybridity of the deer and sheep. These experiments, which were extended to five generations, and finally resulted in successful cross-breeding *between the hybrids themselves*, form a striking commentary on the following assertion :

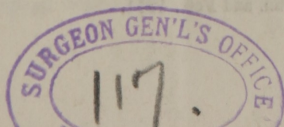
“I have not been able to find the work of Rudolphi, who quotes *old Hellenius*. All the efforts *made in Europe* to produce a hybrid between these species have been unattended with success.”

If this avowal is true, then Stockholm is not in Europe ; a question which I leave to the geographers.

The antiquity of Hellenius, about a half a century, is not so great, I trust, as to disparage his testimony. Truth is by common consent regarded as unchangeable, and it is a fearful doctrine that it can be invalidated by time.

II. On a former occasion, I have shown the dogs of the North American aborigines to be derived from several lupine sources--as the grey wolf and the prairie wolf, and from a combination of these two species with each other. Again the European wolf, which is distinct in species from the grey wolf of America, crosses with the European dog, from which it is also specifically different ; and, finally, these European dogs cross not only with the Indian dogs, but with the American wolves ; thus forming an interminable blending of species, and a most heterogeneous family of dogs.

III. In order to obtain additional information on these points, I ad-



dressed a letter to the Hon. H. H. Sibley, M. C. from Minnesota; a gentleman whose long residence in the North Western territory, and intimate connection with the American Fur Company, have given him especial opportunities for these enquiries. He informs me that the Indian Dog of that country most resembles the common grey wolf, (*Canis occidentalis*) that it reproduces with this species; and that the Indian and European dogs breed freely together.

IV. My Friend Dr. Woodhouse, has just returned from the region west of Arkansas, where he has been for two successive years engaged as a member of a Government Surveying Party. He has, therefore enjoyed remarkable facilities for zoological inquiries; and the most important of these is the fact, proved by a comparison of skulls and skins, that the *Coyotte* or Jackall of Texas and Mexico is a perfectly distinct species, to which Dr. Woodhouse has given the name of *Canis frustor*. It is remarkable, however, that this animal is even yet excluded from the systematic works, or if mentioned at all, is regarded as a mere variety of the *Canis latrans*. And this error I regret to see perpetuated in that splendid work *The Quadrupeds of America*; for therein the true *coyotte*, or Mexican Jackal, is admirably figured by the name of *C. latrans*.*

The specific distinction between these animals having been determined beyond question, I wrote to Dr. George F. Cooper U. S. A. now stationed at Fort Duncan, Texas, for information respecting the habits of the *coyotte*, and received from him the following facts:

“ I do not know whether the Indian dogs re-produce with the wolf, but they do breed with the common or European dog, and so especially does the *coyotte*: I this afternoon saw a dog littered by a common bitch, which had every appearance of the latter wolf. Having made inquiries among the Mexicans, I learn that at almost every *ranch*o can be found the cross between the common bitch and the *coyotte*. I was told of a *ranch*o near here in which there was a bitch that had been lined exclusively by one of the latter animals, and littered seven pups, all having the appearance of the father. There was no dog in the *ranch*o.”

Dr. Cooper then goes on to state that a male *coyotte* was for some time kept about the camp, became very tame, and endeavored on all occasions to associate with the dogs; but he adds, that they had to kill it in order to prevent its crossing with and injuring the breed.

It may be reasonably inquired, whether the hybrids produced between

*This animal in some respects answers to the *C. nigrirostris* of Lichtenstein (Trans. Roy. Acad. of Berlin, 1827,) but the description there given is at best imperfect, and is most applicable to the *C. latrans*. See Proceed. Acad. Nat. Sci. of Philada., Jan. and Feb., 1851.

the dog and *cayotte* are capable of inter-breeding? On this point, I have as yet no positive information; but the attention which is now awakened to the subject, bids fair to furnish a remarkable series of developments in relation to the hybrids of the great dog family. As I remarked, on a former occasion, so little benefit, in the sporting sense, results from these crosses, that they have been, for the most part, the result of mere accident, or have followed a careful experiment, as in the instance recorded by Buffon. If any *economical advantage* was to be gained by the process, I have no question that hybrids of every grade could and would be obtained from many dissimilar species of animals, respecting which, in this particular, but little is yet known to us. I hope to obtain the *cayotte* alive, and to make my own observations on its hybrid powers.

V. My friend Dr. J. C. Fisher, to whose sojourn in the Indian country, and remarks upon the prairie-wolf and indigenous dogs, I have heretofore adverted, has made the following suggestion. He does not regard the Hare-Indian dog, (*Canis familiaris lagopus*) as an analogue of the prairie-wolf, as some zoologists have supposed, but as a domesticated representation of the American jackal, (*C. frustor*); and he arrives at this conclusion from a comparison of the latter animal, as figured by Audubon and Bachman, (under the name of *C. latrans*) with the Hare-Indian dog in the same work, and in Richardson's *Fauna*, and these again with the specimens presented to the Academy by Dr. Woodhouse. That the Hare-Indian dog mixes freely with the other Indian dogs, and also with the European breeds, appears to be settled beyond dispute; and should Dr. Fisher's opinion be confirmed by further observation, we may be able to trace the *common Indian dog* to at least *three* specific wild sources, viz: the grey and prairie wolves, (as mentioned in a former paper) and the American jackal.

VI. In some districts, as among the Esquimaux and other northern tribes, the domestic dog is the grey wolf, (*C. occidentalis*) or its analogue. In other places, the Upper Missouri and Michigan, for example, it seems to be identical with the prairie wolf; while in the country about Mackenzie river, the dog may be presented by a domesticated *cayotte*. But over the greater part of this great region, the three species are more or less blended together, giving rise to that remarkable difference of *size* which has been noticed by all travellers, and which, I trust, is now satisfactorily explained. But I must repeat, that independently of these primitive indigenous forms, and the resulting hybrid breeds, the latter are undergoing a yet further modification by the infusion of the various races of European dogs; and I am informed that in some

parts of the Indian country it would be difficult to find a dog that has none of this exotic mixture.

VII. While engaged in recording these observations, I have conversed with Dr. Henry, who resides at St. Joseph, on the Missouri river about 600 miles above St. Louis. He informs me that the Indian dog of that region closely resembles the *prairie-wolf*; that it breeds with the latter animal and with the European dog; and that he himself possessed an animal of the former cross.

VIII. *Ovi-caprine hybrids.*—Buffon states that in the year 1751-52, he placed together two he-goats and many ewes, and obtained nine hybrids, seven males and two females. On another occasion, a similar experiment produced eight other hybrids; but I cannot find that he ever tried to cross these animals with each other, or with the parent stocks. That he was conversant, however, with the fertility of such hybrids, is evident from the approbation with which he subsequently quotes the following remarks of Mr. Roume de St. Laurent, in reference to the flocks of Bourbon and other islands in the Indian ocean:

“Since the sheep and goat produce with each other the cross breeds called *chabins*, which also re-produce among themselves, (qui se reproduissent) it is probable that this mixture has had an influence on the sheep in general, and causes those results which have been attributed to the climate of those isles wherein the goat has predominated over the sheep.”—*Quadrupèdes*, XXII., p. 400, et XXX., p. 230.

IX. *Caprine hybrids.*—Prof. Pallas, who devoted his life to the pursuit of science under the most favorable auspices, came to the conclusion that the common goat is a mixed breed of two species.—*Capra ægagrus* and *C. ibex*; for, speaking of the *Capra hircus*, (common goat) he says:

“Species adultera e duabus præcedentibus vero simillime sub hominis dominio nata, ideoque corruptæ generationis vi varie degeneret et multiformis.”—*Zoographia Rosso-Asiat.*, I., p. 228.

In another work by this illustrious naturalist, we have some additional observations on the same subject:

“It is now *certainly demonstrated*, from the frequent trials of the *Kirghises*,* cited above, and from the example of the tamed *ibex* seen in the possession of M. P. Rytchkoff, that this animal readily has intercourse with the female domestic goats, and produces a fertile offspring from them; whence, it does not appear to me at all improbable that

* A Mongolian tribe, which possesses immense flocks of sheep and goats, and among whom Prof. Pallas passed a portion of his time during his Asiatic travels.

particular goats are, for the greatest part, a *hybrid offspring*, down from the most ancient times, out of the *ægagrus* and *ibex*, and even, perhaps, from that third Caucasian species, [*Capra Caucasica*] resulting from the various and unnatural blending of these species; a stock, however, which has retained most deeply-impressed characters of the first named parent."—*Spicilegia Zoologica*, II, p. 49.

X. *Ovine Hybrids*.—The observation of Mr. Blyth, quoted by me on a former occasion, only corroborates the opinion of Prof. Pallas, respecting the mixture of species in the common breed of sheep:—

"Species factitia domestica, quæ apud gentes antiqui orbis nomadicas et agricolas mirum in modum multiplicata, et quia sine dubio primum in primæva Asiæ, alpestri et mari circumscripta patria, a captiva tenera prole Argalidis et Musmonis promiscue educatis primum ortum duxit."*—*Zoographia*, p. 233.

XI. In my remarks "on the antiquity of some races of dogs," I adverted to the hounds figured in a hunting scene at Beni Hassan, of the 23d century before Christ, and noticed their resemblance to the modern African bloodhound. On reading Mr. Birch's "Observations on the Statistical Table of Karnark," (p. 56,) I was much pleased to find this hound designated, beyond all question, in a letter of Candace, Queen of Ethiopia, to Alexander the Great, in which the former, among other presents to the Macedonian King, sends "ninety dogs which hunt men."—*Canes etiam in homines efferacissimos nonaginta*. And that nothing may be necessary in explanation, the Queen further designates them as "animals of our country."

XII. Prof. Flourens, of the Garden of Plants, has announced a hybrid between two species of baboon, the *Macacus radiatus* and *M. silenus*?† As this is the first example of the kind, I note it for its singularity; but whether the offspring ended with the first cross, or whether any attempt was made to extend the experiment, I am not informed.

XIII. My friend Peter A. Browne, Esq., of this city, having been engaged for several years in examining the wool and hair of animals by the microscope, and his observations having been more numerous than those of any preceding inquirer in the same department, I requested him to furnish me with a brief exposition of his results, and have been most obligingly favoured with the following note:

*It is worthy of remark, that this great man did not hesitate to change his opinion when new facts convinced him that he was in error:—"Olim perperam pro Argalidis varietate habui Musmonem, et nunc recanto."

†De l'instinct des Animaux, p. 83. He calls those animals by their common names—*Bonnet chinois* et le *Macaque proprement dit*. Of the specific name of the latter, I am not quite certain, but suppose it to be the *M. silenus*.

" You request me to state briefly the discoveries I have made by means of the microscope, micrometer and trichometer, (an instrument invented by myself to determine the ductility, elasticity and tenacity of filaments,) in regard to *pile*; by which latter term I include hair and wool.

" 1. I have found the hair of the head of man is of three principal shapes, viz: the cylindrical, the oval, and the eccentrically elliptical.

" I have noticed the *first* of these forms among the ancient inhabitants of Mexico, Brazil, etc., and also among our existing Indian population and the Chinese. The *second* form is characteristic of the English, French, Hungarians, Germans, Anglo-Americans, etc. The *third* form is that of the Bushman and African negro.

" The pile of the first and second classes comes out of the epidermis at an acute angle; that of the third, at a right angle.

" 3. The pile of the first class is straight and lank; that of the second class is flowing or curling; that of the third class is crisp or frizzled, and spirally twisted.

" 4. The pile of the second class has its colouring matter in a central canal, but I have never been able to detect a central canal in either of the other classes. Their colouring matter appears to me to be disseminated in the cortex and intermediate fibres.

" 5. The cortex of the pile of all those species is squamose; but the scales of the first and second classes are less numerous, are rounded at the anterior extremity, and adhere closely to the shaft; but those of the third class are more numerous, pointed, and not so closely set to the shaft.

" 6. That there are two distinct species of sheep, as determined by their pile, viz: the hairy and the woolly; the pile of the former will not felt nor full; but the wool of the woolly sheep will do both.

" 7. Upon the heads of hybrids formed by the crossing of any two species of men, above mentioned, are found separate filaments belonging to each respectively; and, upon the head of a double hybrid, one, for example, who had the blood of all the three species, I detected the filaments peculiar to them all.

" 8. All hair is not polaric.

" 9. There are various degrees of the felting property in wool, which may be determined by the aid of the microscope, inasmuch as they depend on the number, shape and adherence of the scales.

" 10. The *softness* of any woolly fabric, is in exact proportion to the *ductility* and *elasticity* of the filaments of which it is composed, and these properties can be accurately determined by the trichometer.

" 11. There is no difference between the wool found upon the head of a pure negro, and that found upon the back of a woolly sheep, except in the *degree* of the felting power possessed by them."*

XIV. A friend has kindly pointed out an error in my translation

* See *Proceedings of the Academy of Natural Sciences of Philadelphia*, for January and February, 1851, which contain some additional observations from Mr. Browne.

from Jacquinot's account of the New Hollanders, in my last paper. The words "chaque jour en décroissant," I have rendered as if written "en sé croissant." Not having had an opportunity of proof-reading my paper, (a privilege I waived on account of the lateness of the time at which it was furnished, and the long delay that would have followed its reception and return,) the inaccuracy escaped observation in time to be corrected. To show, however, that it does not affect the conclusions and collateral facts cited by M. Jacquinot, I think it best to give the entire passage in the original words :

"Les quelques tribus qui se trouvaient aux environs de Port Jackson, vont chaque jour en décroissant, et c'est à peine si l'on cite quelque rare métis de l'Australien et d'Européen. Cette absence de métis entre deux peuples vivant en contact sur la même terre, prouve bien incontestablement la différence des espèces. On conçoit du reste que, si ces métis existaient, ils seraient bien faciles à reconnaître et à différencier des espèces mères. A Hobart Town, et sur toute la Tasmanie, il n'y a pas davantage de métis."

What the precise causes of sterility may be in these instances, I do not know : but Dr. Knox, (*Races of Men*, p. 10,) seems to allude to them in the following terms :

"M. Tiedemann of Heidelberg, informed me that he had every reason to believe that the native Australian race differed in an extraordinary manner from the European."

XV. Once for all let me hope that reasonable minds will pardon some errors, both of omission and commission, when the circumstances under which these papers are prepared, are duly considered. I have not proposed to give the bibliography of Ethnology ; yet among the works enumerated in my last *Notes*, I should have given an especial place to the *Natural History of Man*, by our countryman Mr. W. F. Van Amringe, a gentleman who has examined his subject in the true spirit of science, and established, both by fact and argument, some of its fundamental truths and most important conclusions. With the intention of returning to this philosophical work in another series of *Notes*, I shall, on this occasion, merely add his name to those who believe in the diversity of the human species, (of which he describes four,) as expressed in the following paragraphs :

"We do not know a single generic family of animals, the *species* of which are more constant and uniform in their colors than the several *species* of men." P. 285.

"The argument, therefore, that all men are of one species, because the different races run together by easy gradations, amounts to nothing;

for the anatomical and physiological structure and functions of the different races of men, are sufficient to constitute distinct species." P.421.

It would be superfluous on my part to enter into the *theological* question as connected with Ethnology, after the masterly and convincing chapter on this subject by Mr. Van Amringe, headed—"The investigation of the Natural History of Man, in regard to one or many species, is not forbidden by Scripture." P. 46.

The inquirer after knowledge will also read with pleasure and instruction, Dr. Nott's admirable papers on the "Physical History of the Jewish race," and his "Chronology, Ancient and Scriptural," published during the past year in the *Southern Quarterly Review*. I regret that I had not perused this valuable memoir on Chronology, before I wrote my own brief remarks on that important subject..

I am gentlemen, your obedient servant,

SAMUEL GEORGE MORTON.

PHILADELPHIA, *January 31, 1851.*



