Prichard, James Cowles. 1836. *Researches into the physical history of mankind*. 3rd ed. 5 vols. Vol. 1. London: Sherwood, Gilbert, and Piper; Vol I, bk II, ch. 1, 105–111.

# analysis of the different methods of determining on identity and diversity of species.

## Section I.—*Meaning attached to the terms Species—Genera—Varieties—Permanent Varieties—Races*.

The meaning attached to the term *species* in natural history is very definite and intelligible. It includes only the following conditions, namely, separate origin and distinctness of race, evinced by the constant transmission of some characteristic peculiarity of organization. A race of animals or of plants marked by any peculiar character which has always been constant and undeviating, constitutes a species; and two races are considered as specifically different, if they are distinguished from each other by some characteristic which the one cannot be supposed to have acquired, or the other to have lost through any known operation of physical causes; for we are, hence, led to conclude, that the tribes thus distinguished have not descended from the same original stock. This is the purport of the word species, as it has long been understood by writers on different departments of natural history. They agree essentially as to the sense which they appropriate to this term, though they have expressed themselves differently according as they have blended more or less of hypothesis with their conceptions of its meaning. Thus Cuvier, with reference to the animal kingdom, and not without an allusion to the favourite speculations of some of his contemporaries says, “We are under the necessity of admitting the existence of certain forms which have perpetuated [106] themselves from the beginning of the world, without exceeding the limits first prescribed: all the individuals belonging to one of these forms constitute what is termed a species.” And M. De Candolle admitting that there is something hypothetical in the sense attached by him to this term, observes, that “we unite, under the designation of a species, all those individuals who mutually bear to each other so close a resemblance as to allow of our supposing, that they may have proceeded originally from a single being or a single pair.” He adds, “that this fundamental idea is evidently founded on an hypothesis, at least as far as its particular applications are concerned, though it is the only one which conveys precisely what naturalists mean by *species*. The degree of resemblance which authorises our bringing together individuals under this designation varies very much in different families; and it happens not unfrequently that two individuals belonging really to the same species, differ more among themselves in appearance than do others of distinct species: thus the spaniel and the danish dog are, as to their exterior, more different from each other than the dog and the wolf. And the varieties of our fruit-trees offer greater apparent differences than many species.”\*

\* M. De Candolle. Physiologie Végétale, tome ii. p. 689.

M. De Candolle is certainly right in limiting what is hypothetical in the conception of species in its particular applications. The meaning of the term, as I have endeavoured to define it, is sufficiently distinct. To discover some better ground-work than hypothesis on which to rest in particular applications, is the main object of this part of my work.

It is worth while to remark, that the same meaning seems to have been originally attached to the word *genus* or γενος,† which we now appropriate to *species*. These terms, as well as our English word kind, came at length to be applied, by unscientific observers, to particular assortments of organized beings, which so resemble each other as to surest an idea of some near relation between them. Naturalists however, finding that such expressions as the ox-kind, the dog-kind, [107] the cat-kind, were, in popular language, too comprehensively applied to correspond with the results of accurate observation, introduced the use of the term *species*, to designate exactly what genus originally expressed.

† The word γενος might have been defined—ὁια γινονται και ἀφ' ὡν.

It is evident that there exist in Nature, beyond the limits of what we now term species, certain groupes or assortments comprising tribes, whether of plants or animals, in which the particular races are strikingly similar to each other, and of which all the individuals or breeds in each groupe are very clearly distinguished from those belonging to other groupes. Such are all the species of the horse kind; the races of oxen, buffalos, bisons, and auroxen, and the dog and cat kinds furnish other familiar examples. We are unacquainted with any physical causes capable of producing such differences of structure as those which distinguish from each other the different breeds comprehended in each of these groupes; yet they appear to be so modelled upon particular types, that many persons have been led to entertain an opinion, that the differences between such tribes are posterior in time to the era of their first existence. The phenomena of resemblance appear to require some explanation, not less than those of diversity; and a reference of several slightly varied forms to a common type, cannot fail to suggest the idea of original affinity.\* Our observation of the influence which external agents have exercised on races of organized beings reaches back† to no very remote period; and it seems by no means improbable that this influence may have been more powerful in the early stage of the existence of each tribe, than it [108] is at present known to be.\*\* It is true that this kind of speculation loses a great part of its probability when pursued to the extent to which those naturalists carry it, who maintain generally the transmutation of genera and species; and it might be argued, in opposition to their views, that there are in many departments of nature defined groupes referable to particular types or generic forms, which are still very distinct and strongly marked. But we are stopped in limine, by the consideration that all such ideas are merely conjectural, and that the investigations in which we are engaged, refer to matters of fact and not to probabilites. In the present state of our knowledge, a genus is to be considered as an assortment of tribes, on a principle merely of resemblance, and it may, therefore, include more or fewer species, according to the particular views of the naturalist; and the term *species* must be solely applied to those collections of individuals which so resemble each other that, by referring merely to the known and well ascertained operation of physical causes, all the differences between them may be accounted for, and present no obstacle to our regarding them as the offspring of one stock, or, which is the same thing, of races precisely similar.

\* M. Geoffroy Saint-Hilaire, et M. Serres. Mem. du Museum, 9éme année.

† This is undoubtedly true, if we consider the subject on an extensive scale; and the observation as a general one is not refuted by particular instances in which the antiquity of species has been demonstrated, even though M. Bonastre found, either represented or preserved, eighty existing plants in the remains of ancient Egypt, and M. Kunth a twentieth part of our actual plants in the fragments of mummies. These relations are, as it must be admitted, very surprising. De Candolle speaks of *such* facts as establishing the permanency of species for a period of 3000 years. But it must be remembered that the art of embalming in mummies was still in use subsequently to the establishment of Christianity in Egypt; and even in the time of St Augustin, viz. in the fifth century. See Blumenbach, Beytraege zur Naturgeschichte, and Walch de Mumiis. Christianis in Comment. Reg. Soc. Sc. Goetting, tom. iii.

\*\* See some excellent observations by M. Geoffroy Saint-Hilaire, and M. Serres, in the Mémoires du Muséum, 9ême année.

*Varieties*, in natural history, are such diversities in individuals and their progeny as are observed to take place within the limits of species. Varieties are modifications produced in races of animals and of plants by the agency of external causes; they are congenital: that deviation from the character of a parent-stock which is occasioned by mixture of breed, has been regarded as a kind of variety; but varieties are quite as well known in the animal kingdom as the mere result of agencies, often little understood, on the breed, independently of such mixture. Varieties are hereditary, or transmitted to offspring with greater or less degrees of constancy.

*Varieties* are distinguished from species by the circumstance [109] that they are not original or primordial, but have arisen, within the limits of a particular stock or race. *Permanent varieties* are those which having once taken place, continue to be propagated in the breed in perpetuity. The fact of their origination must be known by observation or inference, since the proof of this fact being defective it is more philosophical to consider characters which are perpetually inherited as specific or original. The term permanent variety, would otherwise express the meaning which properly belongs to species. The properties of species are two, viz. original difference of characters and the perpetuity of their transmission, of which only the latter can belong to permanent varieties.

The instances are so many in which it is doubtful whether a particular tribe is to be considered as a distinct species, or only as a variety of some other tribe, that it has been found by naturalists convenient to have a designation applicable in either case. Hence the late introduction of the term *race* in this indefinite sense. Races are properly successions of individuals propagated from any given stock; and the term should be used without any involved meaning that such a progeny or stock has always possessed a particular character. The real import of the term has often been overlooked, and the word race has been used as if it implied a distinction in the physical character of the whole series of individuals. By writers on anthropology, who adopt this term, it is often tacitly assumed that such distinctions were primordial, and that their successive transmission has been unbroken. If such were the fact, a race so characterised would be a species in the strict meaning of the word, and it ought to be so termed.

## Section II.—*Observations on the means of determining as to Identity and Diversity of Species—Analogical Investigation—Ethnographical Investigation*.

From what has been said it is obvious, that there must, in some instances, be a difficulty in ascertaining whether two races of animals or of plants, belonging to the same genus [110] and similar in many respects but different in others, are in reality so many distinct species or merely varieties of one species. The doubt can only be removed by a comprehensive survey of the phenomena related to the origin of varieties in breeds, and of facts in the animal economy, connected with their propagation. The inquiry divides itself into two heads; the first is an investigation of *phenomena taking place in the particular races to be compared*, and in respect to which the question has been set on foot; the second refers to other tribes bearing some analogy in their structure, and in the general laws of their economy to these particular races. The most immediate and decisive proof that the diversities observed between any given tribes constitute only varieties, arises from the discovery of corresponding phenomena of variation in those very races which are the subjects of comparison. Thus, if any one should maintain that asses are degenerated horses, he would establish his opinion to the conviction of every one, if he could only point out an instance in which horses have actually degenerated into asses. A less direct though still sufficient evidence may be furnished by facts which bear, by analogy, on the subject of research. If it can be proved that certain deviations in the form and structure of individuals, analogous to those which are the subjects of inquiry, actually occur in other tribes, that a provision is made for their developement in the laws of the animal economy, that there is nothing in the change supposed to have taken place out of the usual course of organized nature, the inference that such deviations constitute merely varieties, and do not amount to specific distinctions, will be established with a considerable degree of probability, though scarcely with that decisive evidence which the direct manner of proof affords. In adverting to researches into the physical varieties of mankind, the former method of inquiry must be termed the historical or ethnographical one, and the latter the analogical. The first comprises a survey of the different races of men, an investigation of their physical history, the ethnography, as it is termed, of every tribe of the human family, undertaken and pursued in such a manner as to enable us to determine what changes [111] have actually arisen in the physical characters of nations or human races. The second involves every consideration founded on physiology, or the laws of the animal economy, that may serve to elucidate the relation of different tribes to each other in respect to their physical characters and constitution.