VII. *A Letter from Mr.* John Reinhold Forſter, *F. R. S. to* William Watſon, *M. D. giving ſome Account of the Roots uſed by the* Indians, *in the Neighbourhood of* Hudſon's-Bay, *to dye Porcupine Quills.*

N° 2, Somerſet Stable-yard, Strand.
Jan. 16, 1772.

SIR,

Read Feb. 27, 1772.

AMONG the curioſities preſented by the Hudſon's Bay Company to the Royal Society, is a ſmall parcel of porcupine quills, dyed by the wild natives, ſome red and ſome yellow, together with the roots of ſome plants they uſe for that purpoſe.

I examined them careſully, at your deſire, and found that they are probably of the ſame kind with thoſe mentioned by Prof. Kalm, vol. iii. p. 14. and 160 of the Engliſh tranſlation. The one root, dying yellow, is called by the French in Canada, Tiſavoyanne jaune; the other, dying red, has the name of Tiſavoyanne rouge. Prof. Kalm declares the latter to be a new plant, belonging to the genus of Galium, and received by Dr. Linnæus in his Species Plantrum, p. 153. by the ſpecific name of Tinctorium,

on account of its dying quality. It grows in woody, moiſt places, in a fine ſoil. Kalm obſerves, " that " the roots of this plant are employed by the In- " dians in dying the quills of the American Por- " cupine red, which they put into ſeveral places of " their work: air, ſun, and water, ſeldom change " this colour. The French women in Canada " ſometimes dye their cloth red with theſe roots, " which are but ſmall, like thoſe of the Galium " luteum or yellow bedſtraw."

Dr. Linnæus deſcribes this plant, as having ſix narrow linear leaves at each knot of the ſtem, and four at the branches; commonly two flowers are on each ſtalk, and its ſeeds are ſmooth. The roots, when dry, are of the thickneſs of a crow quill, brown on the outſide, and of a bright purple red, when broken, on the inſide.

The ſecond plant, or the Tiſavoyanne jaune, is according to Prof. Kalm, vol. iii. p. 160. " the " threeleaved Hellebore (*Helleborus trifolius* Linn.) " grows plentifully in woods, in moſſy, not too wet, " places. Its leaves and ſtalks are employed by the " Indians to dye yellow ſeveral kinds of their work, " made of prepared ſkins. The French learned " from them to dye wool and other things yellow " with this plant."

Among the roots ſent as a ſpecimen from Hudſon's-bay, I found ſeveral leaves, which I ſeparated, and found the plant undoubtedly to be the threeleaved Hellebore.

In the 4th vol. of Dr. Linnæus's Amœnitates Academicæ is a figure of this plant, which upon compariſon I found by no means to be accurate: for the

the leaves in our ſpecimens, and in thoſe collected by a gentleman who favored me with the ſight of the plant, are far more pointed, than in the engraved figure. The ſtalks have conſtantly but one flower.

The dyed porcupine-quills ſent along with the roots from Hudſon's-bay, are of the brighteſt red and yellow: and this circumſtance ſuggeſted to me the thoughts of trying whether theſe roots might not be uſefully employed in dying. I mentioned it to you, and was encouraged to make ſuch a trial, as the ſmall quantity of the roots would permit.

I boiled a piece of flannel in a ſolution of half ſalt of tartar and half alum: the wet flannel was hereupon put into the decoction of the threeleaved Hellebore-roots, and boiled in it for the ſpace of about 12 or 15 minutes; the flannel, when extracted, was dyed with a bright and laſting yellow dye. A white porcupine quill, boiled in the ſame decoction, became nearly of as bright a yellow, as thoſe ſent over from Hudſon's-bay. This experiment made me believe, that I had hit upon the right method of dying with the threeleaved Hellebore; and will, I hope, prompt the directors of the Hudſon's-bay Company to order larger quantities of this root from their ſettlements, as it will no doubt become an uſeful article of commerce.

The flannel, boiled in ſalt of tartar and alum as above-mentioned, was likewiſe immerſed and boiled for nearly the ſame ſpace of time as in the former experiment, in a decoction of the root of the Galium Tinctorium, but it would dye only a dull and faint red. A porcupine quill boiled with it became yellow, but by no means red. This operation

tion convinced me, that the Indians muſt certainly have ſome method or other to extract the bright and laſting colour, which I could not perform. They uſe perhaps the root quite freſh, which circumſtance probably makes them ſucceed in their dying proceſs. If it could be brought about, to extract and afterwards to fix on wool the dye of this root, it would, no doubt, on account of its bright colour, be a valuable acquiſition for our manufactures: and I do not in the leaſt doubt of the probability to ſucceed in the attempt, as the wollen ſtuffs are animal ſubſtances as well as the porcupine quills, and therefore eaſily ſuſceptible of any dye.

The directors of the Hudſon's-bay Company will, we hope, order their ſervants at the ſettlements to examine carefully and minutely, the method employed by the Indians in dying red with this root, and to ſend an account thereof, and greater quantities of this root over, that ſeveral chemiſts may be enabled to make experiments at large with them; for often, in dying, the experiments will not ſucceed, when tried in ſmall quantities.

The wild inhabitants of North America are certainly poſſeſſed of many important arts; which, when thoroughly known, would enable the Europeans to make a better, and more extenſive uſe of many unnoticed plants, and productions of this vaſt continent, both in phyſic, and in improving our manufactures, and erecting new branches of commerce.

To give an inſtance of this, I will only mention, that the Spaniards of Mexico have but lately learnt of the inhabitants of California, the art of dying

the depeeſt and moſt laſting black, that ever was yet known. They call the plant they employ for that purpoſe Caſcalote; it is arboreous, with ſmall leaves and yellow flowers; its growth is ſtill ſlower than that of an oak; it is the leaſt corroſive of all the known ſubſtances employed in dying, and ſtrikes the deepeſt black; ſo that, for inſtance, it penetrates a hat to ſuch a degree, that the very rags of it are thoroughly black. The leaves of the Caſcalote are ſimilar to thoſe of the Huſiaoke, another plant likewiſe uſed for dying black with, but of an inferior quality. The latitude of California lets us hope, that the country near the Miſſiſſippi, or one of the Florida's, contains this Caſcalote, the acquiſition of which would be of infinite uſe in our manufactures.

Were Natural Hiſtory thus employed in applying the natural productions for procuring the neceſſaries, or adding to the comforts and ornaments, of human life, it would for the future free this ſcience from the vulgar opinion, that it is merely ſpeculative, and incapable of being of the leaſt utility in common life; a prejudice which gains more ground by the injudicious and unprofitable manner, now chiefly in vogue, in ſtudying this branch of human knowledge; and which might be removed, if powerful trading companies would encourage the efforts of the naturaliſt, by enabling them to ſearch the treaſures of nature, in the various countries ſubject to the Britiſh Crown, and connected with its ſubjects by trade and commerce Pardon, Sir, that I detain you ſo long on a point of which you are ſo well convinced, and

which

which you have frequent opportunities to convince others of. I am, with the trueſt regard,

SIR,

Your moſt obedient,

humble ſervant,

John Reinhold Forſter.