From hence it appears, that the air at London was, upon ſeveral days, hotter than it had been obſerved at Madeira for ten years together: for, by Dr. Thomas Heberden's obſervations, mentioned in the Philoſophical Tranſactions, the heat of the air at Madeira, during that period, was never but once at 80.

William Watſon.

LV. *Remarks upon the Letter of Mr.* John Ellis, *F. R. S. to* Philip Carteret Webb, *Eſq; F. R. S. printed in the* Philoſophical Tranſactions, *Vol.* xlix. *Part* ii. *p.* 806. *By Mr.* Philip Miller, *F. R. S.*

Read Dec. 15. 1757. THE paper of mine, which was read before the Royal Society on the 8th of May 1755, and afterward printed in the xlixth volume of the Philoſophical Tranſactions *, was written at the requeſt of Mr. Watſon; who informed me, that a letter from the Abbé Mazeas to the reverend Dr. Hales had been communicated to the Royal Society, in which it was mentioned, that the Abbé Sauvages had made a diſcovery of the juice of the Carolina Toxicodendron ſtaining linen of a permanent black. But Mr. Watſon ſaid, that the letter, he thought, required a careful peruſal before it was printed; and he wiſhed I would confirm it. I told

* Part I. p. 161.

him,

him, if the letter was put into my hands, I would look it over, and deliver my opinion of it.

Accordingly Dr. Birch delivered the letter to me; and, upon reading it, I found, that tho' this might be a diſcovery to thoſe two gentlemen; yet, as it had been mentioned in ſeveral printed books long before, I thought it might not be for the reputation of the Royal Society to have it printed as ſuch in their Tranſactions.

This was my motive for writing that paper: in which I have not endeavoured to depreciate the diſcovery of the Abbé Sauvages, but have only mentioned what had occurred to me in thoſe books of botany, where that ſhrub is taken notice of. And as the knowlege of it, and the method of collecting the varniſh, might be of ſervice to the inhabitants of the Britiſh colonies in America, I took the liberty of adding the account given of it by Dr. Kœmpfer.

Mr. Ellis, in his letter to Mr. Webb, aſſerts, that the American *Toxicodendron* is not the ſame with Kœmpfer's *Arbor vernicifera legitima*. This aſſertion of his makes it neceſſary to lay before the Society the authorities, upon which I have grounded my belief, that they are the ſame. But it may not be amiſs firſt to take notice, that the ſhrub mentioned by the Abbé Sauvages is the ſame with that, which the gardeners about London call the Poiſonaſh. The title of it, mentioned by the Abbé Sauvages, was given by myſelf to that ſhrub, in a catalogue of trees and ſhrubs, which was printed in the year 1730; before which it had no generical title applied to it. And about the ſame time I ſent ſeveral of the plants to Paris and Holland with that title, which

which I had raiſed a few years before from ſeeds, which were ſent by Mr. Cateſby from Carolina.

And altho' this ſhrub had not been reduced to any genus before, yet it had been ſome years growing in the gardens of the Biſhop of London at Fulham, at Mr. Reynardſon's at Hillenden, Mr. Darby's at Hoxton, and in the Chelſea garden, which were raiſed from ſeeds ſent by Mr. Baniſter from Virginia; two of which were growing at Chelſea in the year 1722, when the care of that Garden was intruſted to me.

The firſt intimation I had of the American ſhrub being the ſame with Dr. Kœmpfer's true varniſh-tree, was from the late Dr. William Sherard, in the year 1726, when that gentleman deſired me to bring him a ſpecimen of the American Toxicodendron from the Chelſea garden; which I accordingly did: and then the Doctor, and Dr. Dillenius, compared it with a dried ſpecimen in the collection of the former, which was gathered in Japan, and which, if I remember right, he told me he received from Dr. Kœmpfer ſome years before. It appeared to thoſe two gentlemen, that they were the ſame; and their ſkill in the ſcience of botany was never doubted.

About a year after this, I carried a ſpecimen of the American Toxicodendron to an annual meeting of ſome botaniſts at Sir Hans Sloane's in Bloomſbury; where there were preſent Mr. Dale of Braintree, Mr. Joſeph Miller, Mr. Rand, and ſome others; which was then compared with Dr. Kœmpfer's ſpecimen, whoſe collection Sir Hans Sloane had purchaſed: and it was the opinion of every one preſent, that they were the ſame. Nor has any one doubted of their being ſo, who has compared the American ſhrub with

with Kœmpfer's figure and deſcription of his true varniſh-tree, but Mr. Ellis.

And now give me leave to examine his reaſons for differing in opinion from every late botaniſt, who has mentioned this ſhrub.

He ſays, that the midrib, which ſupports the lobe leaves, is quite ſmooth in the poiſon-aſh, as is alſo the under ſide of the leaves; whereas Dr. Kœmpfer, in his deſcription of the midrib of the true varniſh-tree, calls it *læviter lanuginoſo*; and in his deſcription of the lobes or *pinnæ* he ſays, they are *baſi inequaliter rotunda*; whereas thoſe of the poiſon-aſh come to a point at their footſtalks nearly equal to that at the top. Theſe characters, Mr. Ellis thinks, are ſufficient to prove, that they are different plants: and he blames Dr. Dillenius for having omitted theſe neceſſary characters in his deſcription of it; and ſuppoſes this muſt have miſled the accurate Linnæus, who quotes his ſynonyma.

But as Dr. Linnæus is poſſeſſed of Kœmpfer's book, he would little have deſerved the appellation of accurate in this particular, had he not conſulted the original, but truſted to a copy. But this I know he has done, and is as well aſſured, that the plants in queſtion are the ſame, as Mr. Ellis can be of the contrary.

But here I muſt obſerve, that the branch, from which Dr. Kœmpfer's figure is taken, is produced from the lower part of a ſtem, which ſeems to have been cut down, and not from a flowering branch; and it is not improbable, that his deſcription may have been taken from the ſame branch: and if this be the caſe, it is eaſy to account for the minute dif-

ferences mentioned by Mr. Ellis; for it would not be difficult to produce inſtances of hundreds of different trees and ſhrubs, whoſe lower and upper branches differ much more in the particulars mentioned by Mr. Ellis, than the figure and deſcription given by Kœmpfer do from the American Toxicodendron. I will only mention two of the moſt obvious: the firſt is the white poplar, whoſe ſhoots from the lower part of the ſtem, and the ſuckers from the root, are garniſhed with leaves very different in form and ſize from thoſe on the upper branches, and are covered on both ſides in the ſpring with a woolly down. The next is the willow with ſmooth leaves, which, if a ſtandard, and the head lopped off, as is uſual, the young ſhoots are garniſhed with leaves much broader, and of different forms from thoſe on the older branches; and theſe have frequently a hairy down on their under ſurface, which does not appear on thoſe of the older. So that a perſon unacquainted with theſe differences in the ſame tree would ſuppoſe they were different. And the American Toxicodendron has varied in theſe particulars much more, in different ſeaſons, than what Mr. Ellis has mentioned.

Mr. Ellis next ſays, that the Toxicodendron mentioned by Mr. Cateſby, in his Natural Hiſtory of Carolina, is not the ſame with that, which is now called by the gardeners poiſon-aſh: but I am very poſitive of the contrary; for moſt of the plants in the nurſery-gardens about London were firſt raiſed from the ſeeds, which were ſent by Mr. Cateſby from Carolina; part of which were ſent to the late Dr. Sherard, as is mentioned by him in the Philoſophical Tranſactions, N°. 367; and another part came to my hands,

hands, from which I raiſed a great many of the plants, which were diſtributed, and ſome of them are now growing in the Chelſea garden.

And that this ſhrub grows naturally in Carolina, I can have no doubt, having received the ſeeds of it two or three times from the late Dr. Dale, who gathered them in the woods of that country.

In my paper above-mentioned I likewiſe obſerved, that the ſeeds, which were ſent to the Royal Society by Father D'Incarville, for thoſe of the true varniſh-tree, did not prove to be ſo; but the plants, which were raiſed from them, were taken to be referred to the ſpurious varniſh-tree of Kœmpfer; which I believed to be the ſame, and own, that it is yet my opinion, notwithſtanding what Mr. Ellis has ſaid to the contrary: for the number of lobes or *pinnæ* on each leaf, with their manner of arrangement on the midrib, are the ſame. And here we muſt obſerve, that the figure of this given by Kœmpfer is from a flowering branch; and every gardener or botaniſt muſt know, that the leaves, which are ſituated immediately below the flowers of moſt winged-leaved plants, have fewer lobes or *pinnæ*, than thoſe on the lower branches: therefore I muſt ſuppoſe it to be the caſe in this plant; and from thence, with ſome other obſervations which I made on the ſeeds, I have aſſerted it to be the wild or ſpurious varniſh-tree of Kœmpfer. But Mr. Ellis is of a contrary opinion, becauſe the baſe of the lobes of thoſe plants, which were raiſed from Father D'Incarville's ſeeds, are rounded and indented like two ears. In Dr. Kœmpfer's figure and deſcription of the *faſi-no-ki*, the leaves are intire, and come to a point at their baſe.

Here I think Mr. Ellis is a little too haſty in giving his opinion, as he has not ſeen this plant in the ſtate, that the branch was, from which Kœmpfer's figure was taken. For as there are often ſuch apparent differences between the leaves on the lower branches of trees, and thoſe which are at their extremities, as that in the deſcriptive titles of the ſpecies Dr. Linnæus frequently uſes them to diſtinguiſh one from another; ſo in making the ſame allowance for the plant in queſtion, I cannot help thinking that I am in the right, and muſt abide by my opinion, till the plants, which have been raiſed from Father D'Incarville's ſeeds, have flowered, to convince me of the contrary.

However, I cannot help obſerving, that Mr. Ellis has given a title to this ſhrub before he had ſeen any of the characters, which are neceſſary to determine the genus. And I have pretty good reaſon to believe it ſhould not be joined to the Rhus; for the three ſeeds, which I received from the Royal Society, were ſhaped like a wedge, being thicker on one edge than the other, and not unlike thoſe of the beech-tree, as I noted in my catalogue when I ſowed them; and, by their ſtructure, ſeemed as if the three ſeeds had been incloſed in the ſame capſule.

If it proves ſo, this will by no means agree with the characters of Rhus; eſpecially if the male flowers ſhould grow upon different plants from the fruit, which is what I ſuſpect. Nor can I agree with Dr. Linnæus in this particular of joining all the ſpecies of Toxicodendron to the genus of Rhus, many of which have their male flowers growing upon different plants from the fruit; and therefore would more

more properly come into his twenty-ſecond claſs of *Dioecia*, than his fifth of *Pentandria*, into which he ranges the Rhus. At the bottom of the characters of that genus he has added a note, to ſhew the varniſh-tree is ſo.

But as there are ſeveral other ſpecies, which agree in this eſſential character of diſtinction; ſo, according to the Linnæan ſyſtem, they ſhould be ſeparated from the Rhus, with another generical title.

Mr. Ellis obſerves, upon the poetical deſcription, which he ſays Kœmpfer has given of the leaves of the wild varniſh-tree turning red in the autumn, that he had not found it to be the caſe of the tree growing in the ſtove at Buſbridge. How it appeared in that ſituation, I know not; but the leaves of all thoſe, which are growing in the Chelſea garden, and ſtand in the open air, do conſtantly change to a purple colour in the autumn, before they fall off from the ſhrub: but thoſe of the true varniſh-tree are much more remarkable for the deepneſs of their colour.

Mr. Ellis ſays, he had received a letter from Dr. Sibthorp, profeſſor of botany at Oxford, in which the Doctor informs him, that there is no ſpecimen of the true varniſh-tree in the Sherardian collection at Oxford; but that there is one of *faſi-no-ki*, or ſpurious varniſh-tree of Kœmpfer. How the Doctor could write ſo, I cannot conceive; for I am very ſure there was no ſpecimen of the latter in that collection while it remained in London, having myſelf often viewed that part of it: and ſure I am, Dr. Dillenius never added that ſynonym to the former: and I do believe the latter was no other way known in Europe, than by Kœmpfer's figure and deſcription of it, ex-

cepting that ſpecimen of Kœmpfer's now in the Britiſh Muſeum.

But, to confirm what I have before ſaid, of Dr. Sherard's having a ſpecimen of the true varniſh-tree, I beg leave to quote what Dr. Dillenius has written in the *Hortus Elthamenſis*; where, after having deſcribed the American Toxicodendron, he ſays, *Ceterum hiſtoriam verniciferæ arboris Japoniæ, diligenter et accurate more ſuo exſequutus eſt laudatus Kæmpferius, cujus et deſcriptio et figura, quin et planta ficca, quæ in Japonia lecta ſervatur in phytophylacio Sherardino, noſtræ huic ſpeciei examuſſim quadrat: id tantum, ſexus nempe differentia, præterviſa fuit auctori: quoniam autem ille liber non in omnium his in locis, multo minus in America, manibus verſatur, non alienum videtur, ſi qui, quorum intereſt, hæc legerint, ut norint, quæ ille de collectione & preparatione vernicis illius habet, hoc loco tranſcribere.* Then he goes on tranſcribing from Kœmpfer the manner, in which it is collected.

After this, I find Mr. Ellis is inclinable to think, that the poiſon-aſh, as it is called by the gardeners, is the ſame with the *faſi-no-ki*, or ſpurious varniſh-tree of Kœmpfer. The difference between theſe ſhrubs does not conſiſt in ſmall and minute particulars, but the moſt obvious ſtriking marks of diſtinction appear at firſt ſight; for the poiſon-aſh has rarely more than three or four pair of lobes to each leaf, terminated by an odd one: in which particular it agrees with the true varniſh-tree of Kœmpfer; whereas in the figure, which Kœmpfer has given of the ſpurious varniſh-tree, the leaves have ſeven or eight pair of lobes terminated by an odd one: and this

this figure, as I before obſerved, is drawn from a flowering branch. Every one, who is the leaſt acquainted with theſe things, knows, that the leaves immediately below the flowers are conſiderably leſs than thoſe on the lower part of the branches: therefore this is a more eſſential note of diſtinction than thoſe mentioned by Mr. Ellis.

I muſt alſo obſerve, that Mr. Ellis would ſuggeſt, that I ſuppoſed theſe two ſhrubs were only varieties of each other produced by culture: whereas it muſt appear to every one, who reads my paper, that my intention in mentioning the ſpurious varniſh-tree was to ſhew it was different from Kœmpfer's true varniſh-tree, altho' Kœmpfer ſuppoſes otherwiſe.

For the ſatisfaction of the curious, I have added a leaf of each ſhrub, which are now growing in the Chelſea garden, that if any perſon has the curioſity, they may compare them with Kœmpfer's.

In my paper I took notice, that one of the beſt kinds of varniſh was collected from the Anacardium in Japan; and recommended it to the inhabitants of the Britiſh iſlands in America, to make trial of the occidental Anacardium, or Caſhew-nut tree, which abounds in thoſe iſlands. This has occaſioned Mr. Ellis to take great pains to ſhew, that the eaſtern and weſtern Anacardium were different trees: a fact, which was well known to every botaniſt before; and of which I could not be ignorant, having been poſſeſſed of both ſorts near thirty years. But as I was aſſured, from many repeated experiments, that the milky juice, with which every part of the Caſhew-tree abounds, would ſtain linen with as permanent a black as that of the oriental Anacardium; ſo I juſt hinted,

hinted, that it was worth the trial. Nor was my hint grounded on thoſe experiments only, but on the informations I had received from perſons of the beſt credit, who had reſided long in the American iſlands, that people are very careful to keep their linen at a diſtance from thoſe trees, well knowing, that if a drop of the juice fell upon it, they could never waſh out the ſtain.

But Mr. Ellis, in order to prove that this tree has no ſuch quality of ſtaining, ſays, he has made ſome experiments on the cauſtic oil, with which the ſhell or cover of the Caſhew-nut abounds; and that he found it was not endued with any ſtaining quality. But ſurely thoſe experiments cannot be mentioned to prove, that the milky juice of the tree has not this property: and Sir Hans Sloane, in his Hiſtory of Jamaica, ſays, that the inhabitants of Jamaica ſtain their cottons with the bark of the Caſhew-tree.

I ſhall not intrude farther on the patience of the gentlemen, who may be preſent when this paper is read; but humbly crave their pardon for detaining them ſo long: nor ſhould I have given them this trouble, had not I thought my reputation concerned on the occaſion.