conſiderable advantage gained over the Barbarians, and not over the Romans.

XXIV. *An Account of ſome Experiments relating to the Preſervation of Seeds: In Two Letters to the Right Honourable the Earl of* Macclesfield, *Preſident of the Royal Society. From* John Ellis, *Eſq; F. R. S.*

My Lord, London, Jan. 18. 1759.

Read Jan. 18, 1759. AS the ſupplying our colonies with the ſeeds of uſeful plants, in order to have their produce imported from thence into England, inſtead of the places of their natural growth in Europe, Aſia, and Africa, as we do at preſent, is a matter of ſome importance, therefore I am perſuaded, that experiments tending to promote ſo uſeful and beneficial a work, will meet with the approbation of this honourable Society.

Among many uſeful ſeeds, which I ſent governor Ellis in the year 1757, were ſome acorns of the cork-tree, which were put in a box in ſand. Theſe, he mentions in his laſt letters, were intirely ſpoiled in the voyage; and obſerves, that the confined air in the hold of ſhips, occaſions ſuch hot and penetrating ſteams, eſpecially in warm climates, that it diſpoſes all ſeeds, in common packages, to a ſweating or putrefactive fermentation, by which the vegetative quality of many is intirely deſtroyed: and therefore adviſes,

viſes, that ſeeds ſhould be ſent in tight caſks, and placed on or near the deck, ſo as to have the benefit of the freſh circulating air, at the ſame time the tightneſs of the caſk would ſecure them from the ſalt water.

In order to ſend the governor a freſh ſupply of cork acorns, in a growing ſtate, I tried the following experiments on them to preſerve them ſound; the effect of which I expect to have the honour to lay before this Society next ſummer: but as I tried the very ſame experiments, at the very ſame time, on a parcel of freſh oak acorns, which I collected myſelf at Sydenham in Kent, the latter end of laſt October, and have ſince kept them by me in a box in a warm room, it may give us ſome inſight into what may be the fate of thoſe that are ſent abroad.

The experiments were made between the 25th and 30th of October 1758; and the acorns cut open to ſee the effects, Jan. 17, 1759.

Experiment 1. Acorns of the Engliſh oak ſmeared over ſeveral times with a ſtrong ſolution of gum arabic; and alſo they had been dried in a window, folded in a piece of paper, and put into a deal box.

When theſe were cut open, they appeared hard, dry, and inclining to black, being quite periſhed.

When I firſt thought of making this experiment, I imagined, that the perſpirable matter of the kernel of the acorns could not paſs through the glaſſy, cloſe ſubſtance of the gum arabic; but experience has convinced me of the contrary.

Exp. 2. Some acorns, treated as in the firſt experiment, were wrapped up in papers, ſoaked in a ſtrong ſolution of gum arabic, each in a ſeparate paper:

after they had been dried, they were put in the box with the reſt.

Theſe were ſomewhat ſofter than the firſt, but decayed.

Exp. 3. Some of them were ſmeared ſeveral times over with gum ſenega; and when they were dried in the window, and well hardened, were put in a paper into the deal box.

Theſe looked rather better than the two former parcels; but unfit for vegetation.

Exp. 4. Some of the ſame acorns were put into the middle of a cake of plaiſterers ſtiff loam, or ſuch as the brewers uſe to ſtop their beer barrels, and covered over near an inch on every ſide. This ſoon became dry, without any cracks: it was about 2½ inches thick; and was placed with the reſt, wrapped up in a paper, in the box.

The kernels of theſe were ſhrivelled up, and grown quite dry and hard, like horn, the loam proving a ſtrong abſorbent.

Exp. 5. Some were rolled up ſeparately in thin flakes of bees-wax, warmed, to make it pliable, and put in paper in the box.

Theſe looked very well when they were cut aſunder, and appeared likely to grow; but were a little ſhrunk.

Exp. 6. Some were rolled ſeparately in roſin, made pliable with warmth.

Theſe cut quite freſh.

Exp. 7. Some of them were rolled, each in a thin covering of a mixture of pitch, roſin, and bees-wax, called mummy by the gardiners.

Theſe cut as well, and looked as freſh, as if they had juſt fallen from the tree.

The

The cork acorns, that were ſent to Georgia, were incloſed in the ſame ſubſtances with the foregoing, and put into a box filled with dry ſand, quite full, and well faſtened: this was put into a tight caſk, among papers and wearing apparel, and ſtowed in the upper part of the hold of the ſhip.

While I was making theſe experiments, I wrote to Dr. Linnæus, of Upſal, for his opinion of them, and for his method of preſerving ſeeds in long voyages. I have lately received his anſwer; in which he conſiders the great danger that attends ſeeds in warm voyages, in the ſame light with governor Ellis, and has communicated to me a very probable method of preſerving ſeeds in long voyages, which, he ſays, has never failed. The following is an extract of his letter to me, dated the 8th of Dec. 1758, from Upſal.

" Seeds may be brought from abroad in a grow-
" ing ſtate, if we attend to the following method:"

" Put your ſeeds into a cylindrical glaſs bottle, and
" fill up the interſtices with dry ſand, to prevent their
" lying too cloſe together, and that they may per-
" ſpire freely through the ſand; then cork the bottle,
" or tie a bladder over the mouth of it. Prepare a
" glaſs veſſel, ſo much larger than that which con-
" tains the ſeeds, that, when it is ſuſpended in it,
" there may be a vacant ſpace on all ſides of about
" two inches diſtance between both glaſſes, for the
" following mixture; four parts of nitre, and one-
" fifth part, of equal parts, of common ſalt, and ſal
" ammoniac: theſe muſt be well pounded, and
" mixed together, and the ſpaces all round between
" the outward and inward glaſſes well filled with
" it."

" This ſaline maſs, which ſhould be rather moiſt, " will always be ſo cold, that the ſeeds in the inner " glaſs will never ſuffer, during their voyage, from " the heat of the air.

" This experiment has been tried, and has not " failed."

I am, my Lord,

Your Lordſhip's

Moſt obedient, humble ſervant,

John Ellis.

My Lord,

Read Dec. 20, 1759.

IN a *letter*, which I took the liberty to addreſs to your Lordſhip, dated Jan. 18, 1759, relating to ſome experiments, which I had made to *preſerve the acorns* of *Engliſh oaks* for a longer time than uſual, in a perfect ſtate of vegetation, I there took notice, that I had ſent ſome acorns of the cork oak *to the governor of Georgia*, preſerved in much the ſame manner: but as the ſubſtances I made uſe of for this purpoſe differed a little, I ſhall *deſcribe* thoſe *experiments here more particularly*.

On the 27th of Nov. 1758, I prepared *ſeven parcels* of the acorns of the cork-bearing oak or ilex, in the following manner:

N° 1. 15 acorns, *each* covered over ſingly with a ſtiff ſolution of *gum arabic*, and afterwards rolled up in *gum'd paper*.

N° 2. 13 D°. *each* rolled up in a thin cover of common *yellow bees-wax*, ſoftened before the fire, and rolled up afterwards, ſeparately, in *white paper*.

N° 3.

N° 3. 10 D°. *each* rolled up, as before, in *wax*, and afterwards each covered with a coat of *brewers loam moiſtened* with a thick ſolution of *gum arabic*.

N° 4. 5 D°. *each* coated with *gum arabic*, and afterwards with *whiting moiſtened* with a thick ſolution of *gum arabic*.

N° 5. 25 D°. *each* coated with *gum arabic*, and afterwards with *brewers loam moiſtened* with a thick ſolution of *gum arabic*.

N° 6. 3 D°. *each* covered with *gardeners grafting mummy*, conſiſting of a mixture of bees-wax, roſin, and pitch.

N° 7. 10 D°. *each* covered with *fullers earth* made into a *paſte* with a ſtiff ſolution of *gum arabic*.

Theſe *ſeven parcels* were all put *into* chip boxes, filled with *dry houſe-ſand*, and afterwards put into a *tight caſk*; and arrived in Georgia in *April* following. Governor *Ellis*, in his *letter* to me, dated from thence *May* 6, 1759. ſays, of all theſe experiments, *none ſucceeded but the parcel* N° 3. which had firſt been covered with *bees-wax*, and afterwards with a paſte made of *loam and diſſolved gum arabic*. We even find, that thoſe that were covered with a thin coat of *bees-wax*, and afterwards *with paper*, did *not ſucceed*; as their covering was not thick enough to *keep in their perſpiration*. This was the caſe with ſome of the *Engliſh oak acorns*, which I had coated in the *ſame manner* in *October* 1758, and cut *open* in *November laſt* 1759; their kernels being *ſhrivell'd and decayed*: and thoſe I had covered the ſame time with a mixture of *roſin, bees-wax, and pitch*, tho' their

kernels were *plump* and juicy, yet they, by this time, were *turned brown and rancid*, by imbibing the *ſteams* ariſing from the pitch and roſin, and were rendered *unfit for vegetation*.

It may poſſibly be remarked, that it is no uncommon thing to receive the *acorns* of oaks *from* moſt of the provinces of *North America in a growing* ſtate in *January*, and even in *February*; and therefore it may be aſked, *why* it ſhould require *more care* to ſend acorns of our growth *thither?*

The reaſon of this appears to me, that as the ſummer heats of thoſe provinces by much exceed ours; ſo conſequently *their juices being higher maturated*, are not ſo liable to ſhrivel and decay as *ours* are; which, experience ſhews, are more *watery, and leſs oily*: tho', perhaps, if both kinds were packed up in a *dry, ſoapy earth*, and could be carried at a *cool ſeaſon* of the year, I mean the winter months, they *might equally ſucceed*; but, in this kind of weather, we have *ſeldom an opportunity* to ſend them, ſo as to expect their arrival before the weather, in the ſouthern parts of North America, begins to grow too warm, as the ſhips ſeldom arrive there till April.

The cheſnut, next to the acorn, being the moſt difficult to preſerve ſound during the courſe of one ſeaſon, or a whole year, on the 23*d of February* laſt, 1759, I procured a parcel of *Spaniſh cheſnuts*, juſt as they were imported, many of which were ſounder than they generally are ſo late in the ſeaſon: theſe I divided into *four parcels*, and put *each* parcel into a ſmall *earthen jar*, involving them in the following ſubſtances:

Jar

Jar N° 1. 12 Cheſnuts in mutton ſuet.
2. 12 D°. —— in bees-wax and mutton ſuet, equal quantities.
3. 12 D°. —— in bees-wax.
4. 12 D°. —— in bees-wax and yellow roſin, equal quantities.

Theſe ſubſtances I *melted*; but did not pour them among the cheſnuts, till I could *bear* my *finger* in them without the leaſt ſenſible uneaſineſs, which I conſidered as the proper teſt not to affect the kernels by their heat, and immediately *immerſed the jar* to the brim in *cold water*.

As this experiment was made with a *view* to give thoſe gentlemen ſome hints, who go to the *Eaſt Indies*, I placed theſe jars in a room, where they were *expoſed* to the *unuſual heats* of laſt ſummer; heat being the great promoter of the putrefactive fermentation of vegetables, and which it is very hard for ſuch gentlemen to guard againſt, eſpecially as they are obliged *twice* in their voyage home to *paſs the equinoctial line*.

In order to examine the effects of theſe experiments, and to lay before the Society a fair account of them, I *broke* all the *jars on the 22d of November laſt*, before ſome ingenious gentlemen of the Society, very intelligent in theſe matters, and found, that jar N° 1. which contained the cheſnuts immerſed in mutton *ſuet*, proved *all rotten*, attended with a very diſagreeable *putrid ſmell*. Thoſe in jar N° 2. were *moſt* of them *ſound and freſh*, and their kernels as white and ſweet-taſted, as when *freſh gathered*. Theſe were incloſed in half bees-wax, and half mutton ſuet, melted together. Thoſe in jar N° 3. were

equally

equally ſound and well-taſted, and had been incloſed in bees-wax only.

Though *part* of the cheſnuts in theſe jars were *rotten*; yet it appeared plainly to be *owing to ſome defect* in them when they were *firſt* immerſed into theſe ſubſtances; moſt probably to the lateneſs of the ſeaſon, when the experiments were made.

Thoſe in jar N° 4. which were incloſed in half bees-wax and half yellow roſin, were *all turned ſoft and ſpongy*, of a *brown* colour, and a moſt *diſagreeable taſte and ſmell*, from the reſinous ſteams they had imbibed.

On the 24th *of November* laſt, I *planted ſix* of the cheſnuts preſerved in wax and ſuet (N° 2.) and *ſix* of thoſe preſerved in wax only (N° 3.) in two *garden pots*, and placed them in a very ſpacious *conſervatory*, belonging to my worthy friend Philip Carteret Webb, Eſq; F. R. S. at his ſeat near Godalmin in Surry; where I have the pleaſure to inform your Lordſhip and this honourable Society, that *many of them are already germinating*; which *proves* this *method* of preſerving the larger ſeeds a very *proper* one to recommend to gentlemen that go to *China*, and other parts of the *Eaſt Indies*, to preſerve many kinds of valuable ſeeds in a ſtate of vegetation during a voyage of a *whole year*, till they arrive here; and probably till they are carried to our ſettlements in the American colonies.

It remains then, for gentlemen who go to the *Eaſt Indies*, to place the ſeeds they preſerve in *bees-wax, or bees-wax and ſuet*, in the *cooleſt part* of the *ſhip*, to prevent theſe ſubſtances being affected with the heat of thoſe parts, which far exceeds ours. *Perhaps Dr. Linnæus*'s method of incloſing them in a larger veſſel,

veſſel, and ſurrounding them with a *mixture of ſalts*, deſcribed in my former letter, will *anſwer this end*. He ſpeaks with ſo much certainty of its ſucceſs, that I think it worth the trial, eſpecially when he *aſſures* us it *never fails*.

I am, my Lord,

Your Lordſhip's

moſt obedient humble ſervant,

London, Dec. 13. 1759. John Ellis.

P. S. Small ſeeds, in their pods, may be preſerved by being placed thinly on pieces of paper, cotton or linen cloth, that have been dipt in wax, then rolled up tight, and well ſecured from air by a further covering of wax.

XXV. *The Caſe of a very long Suppreſſion of Urine.* *By* Ambroſe Dawſon, *M. D.* *Communicated by* William Heberden, *M. D. F. R. S.*

Read Nov. 8, 1759. R. W. aged 23 years, tall and well-made, was ſeized, in the year 1755, with a weakneſs of one ſide, which ſoon went off, leaving only one knee weak and ſwelled; for which ſhe was admitted into St. George's Hoſpital.

On the 4th of April, 1756, ſhe had a ſtoppage of urine, and felt no diſpoſition to make any for two days. During the whole month of April, the diſcharge of urine was very irregular, it having ceaſed at one time for five days, and at another time for nine days. When the catheter was introduced, little or no urine was found in the bladder.