

Five letters to Sir Joseph Banks ... on the subject of cochineal insects, discovered at Madras / [James Anderson].

Contributors

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F I V E L E T T E R S

TO SIR JOSEPH BANKS Baronet

President of the Royal Society,

ON THE

Subject of Cochineal Insects, discovered at Madras,

By JAMES ANDERSON M. D.

With a Copper Plate Engraving Annexed, of the different INSECTS,
mentioned in the Letters, from the Drawings of BARON REICHEL.

Also an Engraving of the *Opuntia Major Spinulis obtusis mollibus, & innocentibus*, and the Plan of a Nopalry in the Bishoprick of Guaxaca in the Kingdom of Mexico, Extracted from the Second Volume of SIR HANS SLOANE'S HISTORY OF JAMAICA, for the use of Country Gentlemen who may be disposed to make Plantations, and are not in possession of that Work.

————— MILEZIA MAGNO
VELLERA MUTENTUR, TYRIOS INCOCTA RUBORES.
VIRG. GEOR. LIB. 3.

MADRAS: Printed by CHARLES FORD.

AT THE HONORABLE COMPANY'S PRESS.

—————
MDCCLXXXVII.

FIVE LETTERS

TO SIR JOSEPH BANKS Bart.

President of the Royal Society

ON THE

Subject of Geological Inquiry, Illustrated in Manuscript

BY JAMES HUTTON Esq.

With a Copper Plate Engraving of the different Strata
exposed in the Firth of Forth, Scotland.

And an Engraving of the Crinoid, a new fossil
discovered in the same strata, and which is
supposed to be the same as the Crinoid of the
Fossiliferous Limestone of the Devonian System.
The author has also inserted a description of the
Fossiliferous Limestone of the Devonian System,
and a description of the Fossiliferous Limestone
of the Devonian System.

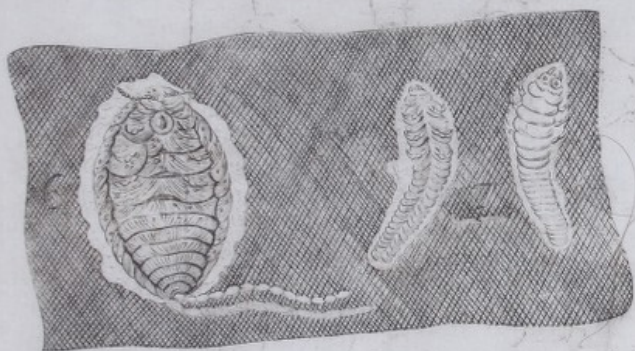
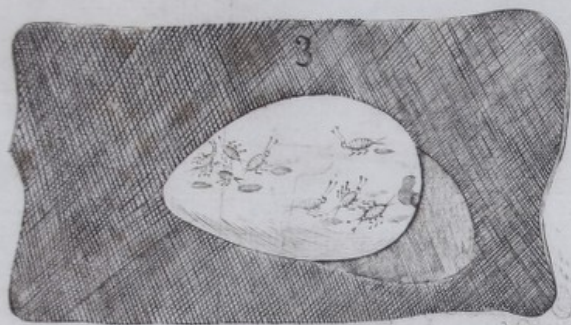
Printed by W. & A. G. Smith, Edinburgh.

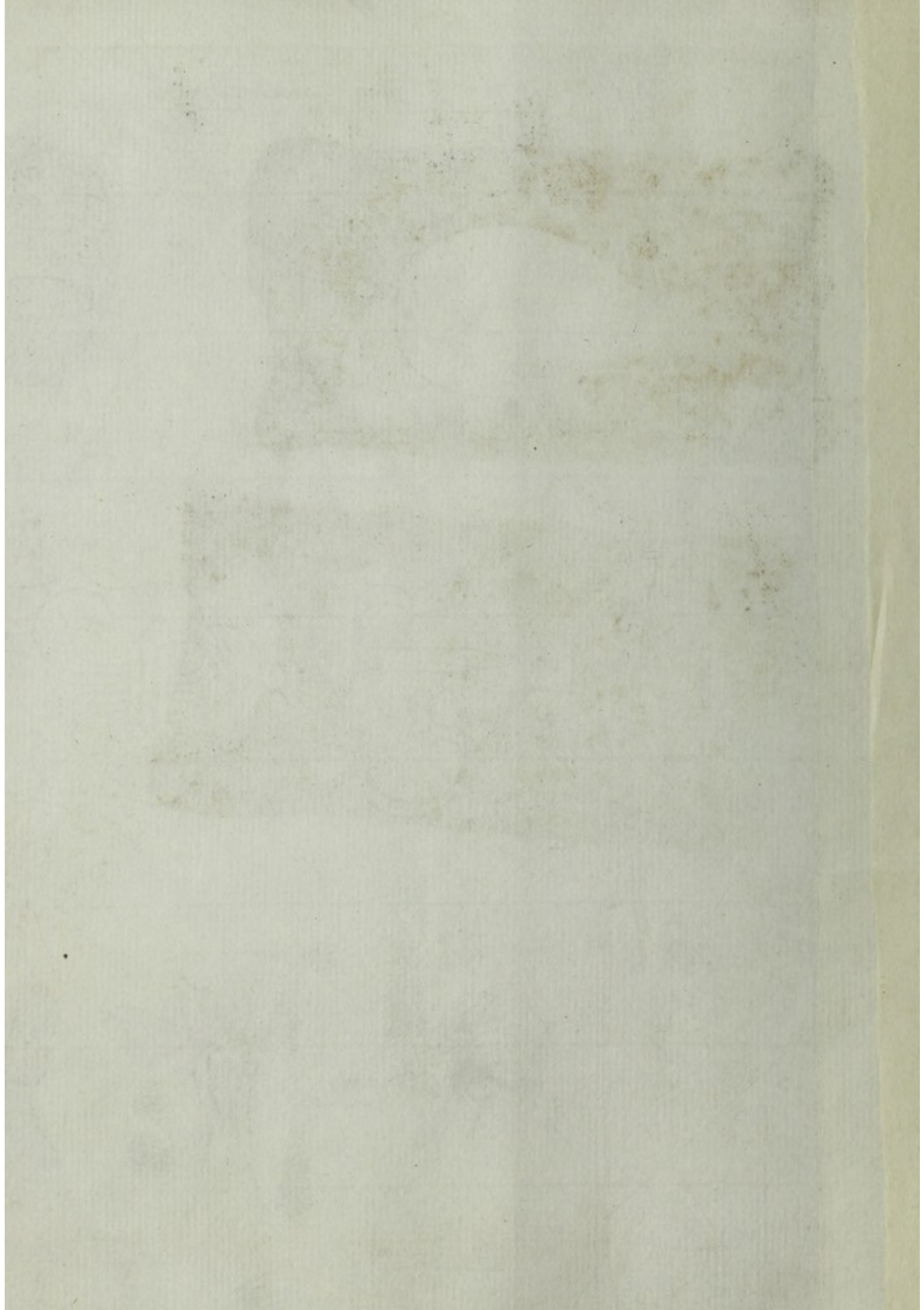


BY JAMES HUTTON Esq.

At the Edinburgh Convention

1830.





To Sir JOSEPH BANKS Baronet,
PRESIDENT of the Royal Society.

DEAR SIR,

HAVING found the Cochineal Insect attached to a grass called by the *Tamuls*, *Oopungiriki* or salt grass, the common food of the Horses here, which is jointed and creeps along the ground taking fresh root and sending off lateral branches at the articulations with small pointed leaves embracing the stalk, an erect spike, with *sessile* flowers, each having three double oval purple coloured *antheræ*, with two feathered white *stigmata* an oval shaped compressed seed, which grows only on a clay soil common in this neighbourhood and all along the coast where the *Mineral Alkali*, *Sea Glauber* and *Epsom Salts*, effloresce like hoar frost on the surface and where on digging there are found *Nodules* of lime stone pieces of *Selenites*, branches of *Osteocolla*, *Plume Alum*, and *Deliquescent Salts*.

I carefully examined it with the help of magnifying glasses and found it correspond with the descriptions of *Lewen boeck*, *Reaumeur*, *Linnaeus*, *Sir Hans Sloan* and the French Encyclopædia as well as with the Cochineal of the Shops.

The Insect as it is found on the grass is in its *Chrysalis* state containing the *germ* or *ova*, and multitudes of the young are daily issuing of a red colour with six legs and two *antennæ*: some with wings are said to be the males.

I have macerated them in water and spirits of wine, and find it communicates to both a colour equal to the Cochineal of Mexico.

As the expence, however, of collecting it in its present scattered situation may prevent its becoming an article of trade from this coast; I have planted a piece of ground with the grass, on which I have strewed a great number of the insects, as well as set out 1000 *Opuntia* plants for the purpose of
of

of cultivating them in the Mexican method, with the success of which I shall from time to time inform you.

Your distinguished character in the culture of Natural History will apologize for this communication, and excuse my transmitting you a small box of the Cochineal prepared by roasting over the fire, together with some of the Insects on the grass on which they are found in a native state,

I am, with much esteem,

Fort St. George

Dear Sir,

Dec. 3d. 1786.

Your very Obedient Humble Servant,

JAMES ANDERSON.

TO SIR JOSEPH BANKS Baronet,

PRESIDENT of the ROYAL SOCIETY.

DEAR SIR,

HAVING on the third instant sent you some Cochineal Insects found here, which from their being recently collected I fear may be spoiled on the passage, as I now find they require a considerable time to dry; I take this opportunity of the Phoenix and Man ship sailing to transmit a specimen which is better cured.

At this season I find the *Cicadæ spumantes* on various grasses, and on some *Syngenesias* in places adjacent to where the Cochineal is found, and numerous collections of the *Cimex punctatus* on the *mimosa Arabica*, also a beautiful *Aptera* with six legs and two antennæ, about the size and shape of the *Cotyledon* of a pea on a purcellan leaved *Salicornia*.

As the Vitriolic and Marine salts prevail much near the Coast, the Nitrous acid is not found to generate nearer than ten miles from the Sea where it is in some places manufactured for salt petre, and the *Oldenlandia umbellata* with a decoction of the roots of which the beautiful and permanent red is given to Cotton will only yield a colour when cultivated on the sea Coast—Above one half of the lands within several miles of the sea shore consists of such soil as I described in my former Letter, and produces the Cochineal Insect in considerable quantity, and in all probability, as there are many salt lakes on the Coast their banks produce abundance of the grass on which the Insect is found—This species of grass which I think approaches nearest to the *Ara spicata*

spicata will not grow on sweet grounds; but only in places where the *Scirpus* and *Cypress* graffes with various kinds of *Salecorna*, and *Coldenia* are found, and these lands are considered as waste.

There are generally only one or two on one joint of the grafs, but sometimes they amount to five or six, so that one stalk will have twenty or thirty Insects upon it, yet it is by no means clear, either that it can be cultivated, or that the cultivation will be attended with advantage, for the *Cactus* here is armed with very long sharp thorns whereas that of America is said to be inoffensive, and the Crimson decoction of the Cochineal in the trials I have yet been able to make, does not change to the colour of arterial blood when a solution of Tin is poured into it.

As it agrees however in the other characters of the *Coccus Cacti* in the Linnæan system I have distinguished this Insect—*Hemiptera Coccus Aïræ spicata Madraspatensis*.

For farther illustration of this minute subject, I have been so fortunate as prevail on a friend of mine, Baron Reichel, to take the several drawings which accompany this.

- No. 1. The grafs with the Insect upon it.
 2. The Fly supposed to be the male viewed with the Microscope.
 3. A Microscopical view of the *Coccus* with the young Insects upon it supposed to be the female.
 4. The *Crysalis* disengaged from its silky envelope.

N. B. The Microscope by which these drawings were taken with every attention to proportion and exactness, is the make of Gilbert Optician, Ludgate-Hill London—Glass No. 4.

To Sir JOSEPH BANKS Baronet

PRESIDENT of the Royal Society.

DEAR SIR,

SINCE writing to you by the Ship Phœnix, I have had above a hundred pounds weight of the Cochineal insect brought in from the adjacent country, and learn from correspondents they may be collected even

even in greater plenty to the northward, at *Duraspattam* about 50, and *Nellore* 90 miles from hence.

The young creep on any thing in their neighbourhood indifferently, a leaf of *Opuntia*, a spike of glass, or a clod of earth; but in our management do not survive eight days.

The great quantity with which I have been supplied, from which millions of young have come under inspection, has however enabled me to investigate the Fly more minutely, and I now find it is furnished with four *procumbent* wings, which brings it more properly under the *Kermes*, than *Coccus* kind of the *Linnaean* system, but as the character *Saltatoria* is wanting, it may be a new genus; to compleat the description of which the microscopical view of a *Caterpillar* found within the outer *Coccus* amongst the young insects is annexed No. 5.

These Caterpillars are as numerous as the male flies, which do not exceed the proportion of one male to two hundred females.

Swammerdam observed that such a Caterpillar on the dog Rose and black poplar produced a moth or fly, as represented in Doctor Hills translation Tables XLIV and XLV but hitherto I have seen no change of state in these Caterpillars.

I come now to acquaint you I have found an Insect on the *Phyllanthus Emblica* or *Nellikai* of the *Tamuls* of a purplish red colour and surrounded with a filky covering, of so loose a texture, that the threads of it which are as fine as those of the smallest spiders web, may be drawn out to the length of several inches before they break.

This insect is now *oviparous* and deposits its eggs in the filky nest, one of them under the microscope discharged 13 eggs which appeared like a string of purple beads.

I have hitherto seen no flies belonging to them, and am therefore unable to give them any generic name, but they appear so like the drawings for the female *Cochineal* described by Mr. Ellis, *Philosophical Transactions* Vol 52d, part 2d, page 664, of which a few days ago I obtained a Copy—that I have prevailed on my friend Baron Reichel to take a microscopical drawing of this Insect which is annexed and marked No. 6.

Linnaeus

Linnaeus in his notes says the *Aphis* is *viviparous* in summer, and *oviparous* in autumn by analogy it may be presumed, that altho this Insect is *oviparous* at present, it may become *viviparous* in the months of May and June.

Finding a Caterpillar likewise inclosed in the silky covering of these Insects, a drawing thereof, as it appears in the microscope, is annexed No. 7.

I have likewise found a *viviparous* Insect covered with white *Farina* on the *Robinia Grandiflora*, or *Agaty Jumbo* of the *Tamuls* on the *Psidium Quajava* and *Hebiscus Rosa Sinensis* with a nipple between the two foremost pair of legs, a drawing of which is enclosed No. 8.

These Insects are only of a purplish orange colour; but observing the *Aphis* on the cabbage leaf green, on the *Apocinum-Scandens* yellow, and of a chocolate colour on the orange tree, I am disposed to believe the colour of Insects is much affected by the nature of their food, and therefore have placed all of them on the *Opuntia*.

The *Abbé Reynal*, in his last edition, says the *Opuntia* in *MEXICO* must be carefully planted and cultivated eighteen months before it will produce any *Cochineal*, and *Plukenet*, and after him *Sir Hans Sloan*, whom all succeeding writers have copied, expressly declare the *Opuntia* bearing *Cochineal* to have only soft, inoffensive thorns; now I am free to say, the wild Plum, Sloe and Raspberry, as well as the Orange tree are more armed than after they have been cultivated, the *Mimosa Arabica*, known here by the name of the *Cock-spur-thorn*, when cultivated in a garden almost loses that distinction and the hardest wood I have ever observed grows without culture, *Linnaeus* in his *Philosophia Botannica* Page 50 says—"spina est mucro plantæ e ligno plantæ protusus, *Prunus*, *Rhamnus*, *Hippophaë*, *Celastrus*, *Lycium*, cultura sæpius evanescit; ut in *Pyro*."

If the same effect is produced on the *Opuntia* by the like means, which is more probable as the prickles are deciduous, the end I had in view of introducing the culture of *Cochineal* may be accomplished; because although my *Opuntias* have not been planted out three months, they are already putting forth young leaves, on which I perceive a few of the last mentioned insects beginning to fasten.

Having been solicitous however to attend to such respectable authority,
I have

I have sent copies of the drawing and discription of the plant *Sir Hans Sloan* saw in *Mr. Worley's* garden in Jamaica, to Hydrabad and Bengal.

I am with Esteem,

Fort St. George

Dear Sir,

Feb. 20th 1787.

Your most Obedient and very

Humble Servant

JAMES ANDERSON.

To Sir Joseph Banks Baronet.

PRESIDENT of the ROYAL SOCIETY.

DEAR SIR,

I N addition to my letter of the 20th ultimo I beg leave to inform you, I have had some pieces of Flannel, Shawl, and Sattin, prepared with allum and cream of Tartar, and afterwards boiled in a decoction of cream of Tartar, and the galls Cochineal, of which the inclosed specimens will I hope not prove unworthy of your inspection, as the colour is struck into white materials without the assistance of any colouring drug that has been known heretofore, and simply as I have stated it.

I have not yet been able to ascertain the fly of the *Phyllanthus Emblica*; but finding that of the *Psidium Quajava*, *Hebiscus Rosa Sinensis*, and *Jumbo* of the *Tamuls*, likewise on the *Annona squamosa* or *Atamarum*, and *Ara-Nellikai* of the *Tamuls*, as well as on my *Opuntia* plants.

I placed branches of the *Guava Tree* covered with the Insects on the *Opuntia* leaves, which have since multiplied to that degree, that some of the leaves are intirely covered with a white hairy scurf—from the *Opuntia* leaves I enclose the following drawings.

No. 9. The female.

10. The Fly.

11. The Caterpillar.

The Caterpillar is so intimate a companion with all these Insects, I am almost persuaded it is a *mule* or *spadonis*, as we see amongst bees and ants.

All

All the hairs represented on the female, fall off about the time she deposits her young, and serves to shelter them till they fasten themselves to the leaf of the *Opuntia*.

The two very remarkable hairs of the Fly are perfectly opaque and white, and only a little longer than the body.

The Body of the Fly is of an Amber colour.

The wings, before the Fly comes from under the cover of the hairy crust are colourless and transparent; but after it has issued from that covering, and been some days exposed to the open air they become of a crimson hue; they amount only to two in number.

The *antennæ* consist of ten joints at each of which are three short hairs.

The Eyes, two remarkably black spots immediatly behind the antennæ.

The head is very close to the thorax.

The abdomen is shaped nearly like that of the dragon-fly.

The legs consist of three joints and altogether hairy: and his whole size so small as with difficulty to be discovered with the naked eye.

I am with esteem

Fort St. George,

March 20th 1787.

Dear Sir,

your very obedient Servant

JAMES ANDERSON.

To Sir Joseph Banks Baronet,

PRESIDENT of the ROYAL SOCIETY.

DEAR SIR,

I SIT down to acquaint you I have found the Cochineal of the *Phyllanthus Emblica* mentioned in my Letter of Feb. 20th, not only on that Tree; but likewise on the *Annam Pachericbi Poondoo* of the *Tamuls* or *Parietaria Indica* of

of Linnæus, and on the *Cbindel Coddî* of the *Tamuls*, or *Tippa Tiga* of the *Talingas*.

Having no other object in view besides the illustration of natural knowledge, and my declared intention of introducing the culture of Cochineal here, though not for mortals to command success; yet you may be assured I wish to deserve it; for having been so happy as to be led into a correspondence with you by an accidental discovery, I have spared no pains to support its tending to the purposes I have mentioned, and crave no farther indulgence than may fairly be admitted.

It is true that on discovering the grass Insect on the 20th of last November, the semblance and richness of colour induced me to think it a *Coccus*, and while I could see only two wings on the male fly, was firmly persuaded it might prove the *Coccus Cacti*, as you may perceive by my second Letter; in which opinion I continued till such time as I had collected a considerable quantity, and by placing the fly in such a manner as to distend the wings, plainly saw there were four, when I thought it a *Kermes* more especially as Linnæus mentions a *Kermes graminis* of the *Fauna swedica*, but considering the *Kermes* to be an Insect well known to himself, and that mine did not possess the character *Saltatoria*, I was driven to the necessity of considering it a new genus; for it can never be presumed that the genius of Linnæus would affix the character *Saltatoria* to a genus the males or winged part of which only possess that character.

Indeed the males of all the three different Insects I have discovered leap like a flea, which renders it very difficult to catch them, of which I can speak more certainly, having since writing you, discovered the *Phyllanthus Emblica* Insect in considerable number not only on that Tree, but likewise on the plants I have mentioned; which, by placing branches covered with the Insects under a glass shade, has enabled me to find the male fly, the account of which fly is all that remains to complete the description of three new Insects, each consisting of Males, Females, and Spadones: and as it may occasion some surprise I should venture on untrodden ground, by introducing these, *Drones*, *Mules*, or *Spadones* into a genus which has already been described by some able naturalists, I can only say in my own justification, that having established the genus in the description of the Males and Females, I have been convinced the *Caterpillar* belongs to the genus by the circumstance of finding them amongst the young of the grass cochineal, betwixt the outward shell, and the *Aurelia*, which you will not wonder at in me who professes no attachment to any system, farther than it assists description.

After

After the account I have given of the *Phyllanthus Emblica* Insect, so much agreeing with the Female Cochineal described in the Philosophical Transactions, it may perhaps be expected the Male Fly should likewise correspond—but believing your learned society to have more liberal ideas of nature, I must without reserve acquaint you he is considerably different, altho' not so much so as to remove him from the genus *Coccus*.

The *Antennæ*, are as long as the body of the Insect, having a remarkable joint at their insertion and ten other articulations just perceptible with the assistance of the Microscope.

The Eyes, large jet-black spots, one on each side of the Head.

The Head, globular, and set closely on the *Thorax*.

The whole Head (the Eyes excepted) *Thorax* and *Abdomen*, are of a homogeneous, transparent, appearance, like Amber in colour.

The wings only two in number, *procumbent*, and twice as long as the *Abdomen*—At the extremity of the *Abdomen*, are two little knobs, like the commencement of hairs, accompanying this is likewise a Drawing by Baron Reichel, marked No. 12.

Although I have not yet been successful in feeding this Insect on the *Opuntia*, yet as the leaf of the *Cbindel Codd* is so large and smooth, it is used here as a plaister for the maturation of Boils—I have placed a row of the Plants round one of my Plantations of *Opuntia*, with a view to collect the Insects from it, just before they begin to spin their web.

In the *Vydeeooodoo Sbafter*, or Medical text of *Darmantree*, and I believe likewise in that of *Ashvanadevudoo*, writings of sacred authority amongst the Bramin Physicians of this part of India, a sugar made from Decoction of the *Tippa Tiga* is directed as a remedy in a species of their Nosology, named *Vatum Mekum*.

Vatum means air or wind in the *Sbafter* writings, and *Mekum*, internal heat.

All pains in the Limbs attended with swelling, such as the *Gout*, *Arthritis* and *Rheumatism* are classed by *Darmantree* under the head *Vatum*; and *Mekum* the head of Diseases of heat; so that *Vatum Mekum* according to him is a compound Disease, arising from redundance or decomposition of air, and heat or Inflammation.

I men-

I mention these circumstances in proof of the wholesomeness of the *Tippa Tiga*, as the fitness of its juices as a food for Insects may probably depend on this circumstance, seeing they are seldom or never found on plants that are noxious to man or animals; and I further apprehend it to be no other than the *Menispermum cordifolium*, mentioned in the Hort. Mal. VII. F. 21.

Having now completed the description of three new Insects, the first on grass a new genus will stand in the *Linnaean* System most naturally between *Kirmes* and *Coccus*, under the generic name *Chloceon*, or grass Egg,

The second of the *Nellikai* Tree, a new species of *Coccus*.

The third of the *Guava* Tree, a new species of *Coccus*.

These being the Trees on which I first found them.

I must here take leave to insert some remarks of Doctor Patrick Russell at Vizagapatam, on a specimen of the grass Cochineal, which I transmitted him some time ago, and on whose accuracy I have a well founded reliance.

“ In comparing the new Cochineal with a small parcel of the Spanish, the grain appeared much smaller, more splendid, and there was little or none of the whitish dust observable, with which the Spanish is usually bestrewed circumstances which may be partly owing to the drying or preparing &c.

“ Three grains weight selected from each parcel of the largest grains of Cochineal were found as follows, new Cochineal 43 grains, the Spanish 14.

“ Three grains taken indiscriminately from each parcel, the grains of Cochineal when counted, were found as follows upon three different trials, new Cochineal 63, 66—60, Spanish, 23, 19—22.

“ An infusion of five grains of new Cochineal in three drams of common water (the Cochineal being finely pounded) gave a good tincture, but after three days became putrid and offensive in an open vessel, five grains of the Spanish, treated in the same manner showed no signs of putrefaction in less than a week or more, this may be accounted for from the different ages of the drug, and the mode of its preparation.

“ Five grains of the new Cochineal digested in half an ounce of Spirit of Wine, afforded to my eye a brighter tincture than that prepared from the Spanish in the same manner, and maintains the preference though two months are nearly elapsed, this tincture though preferable to the eye
“ makes

“ makes little or no impression on paper, while the Spanish gives a red
 “ Ink colour, both tinctures were equally dilute and so far unfit for Ink ;
 “ another circumstance remarkable is the difference in dryness of the two
 “ Cochineals, owing partly perhaps to the mode of drying partly to age,
 “ the Spanish was easily reduced to powder, the Madras by trituration was
 “ turned into paste.”

In addition to what Doctor Russell has said, I must observe, the fresh gathered Insects yield a brighter colour as after roasting to kill the young they acquire a considerably darker hue, the want of whiteness on the outside, is owing to the silky shell being carefully picked off, whether this trouble is proper or not, I am yet at a loss to determine, but even the proper skin of the *Aurelia* is of a closer texture as he very justly observes is more splendid, and when thrown into water without previous trituration gives out none of its colour, whereas the criterion amongst Merchants of genuine Cochineal, is the darting of red rays, from it even to the bottom of a glass of water soon after immersion; perhaps this quality is what preserves our Insect from total destruction, during the *Monsoon*; I observe too that on some grass, cultivated so as to grow more luxuriant, the Insects have been found considerably larger than on the waste lands.

The Specimen he us'd had been exposed to the Sun every day for two months, when the Thermometer in the Shade was about 78° yet it could not be reduced to a powder, owing to fat with which it abounds; and I think, shields it from the action of acid Salts—Yet it readily communicates a Pompadour or deep Red colour to woollen and animal matters, when used in the quantity Doctor Lewis in his notes to the Translation of Newmans Chemistry, says he found necessary of the Silvester Cochineal, and a decoction made in lime water becomes Purple, which colour it in some degree imparts to Linnen and Cotton.

By means of a friend, Captain Doveton, I have traced the existence of the grass Cochineal all the way from this place to Vizagapatam, and although I have not been able to find it on any plant besides the grass mentioned in my first letter, and on that only in its *chrysalis* state, when the whiteness of its silky envelope renders it conspicuous, yet it appears to me any quantity, that could be brought into use may be collected, as the fields from whence I have had every Insect brought that could be found are again as plentifully stock'd in five or six weeks after, as ever; and in all probability they may be found every day in the year except the month of October, when the country is covered with water.

The expence of collecting and curing them I suppose could not be under five or six shillings a pound, so they could not be brought to market in Europe at a lower rate than half a guinea the pound, with respect to colour

too I must observe it may require much attention to discover the best time for collecting and curing Insects, for in the account of Persia in Harris's voyages there is the following remark of Sir John Chardin.

“ In the places adjoining to Morant grow plenty of fruit the best of all in Media, but that which is most particular, in these parts is this, that they here gather Cochineal, though in no great quantity nor for any longer time than only eight days in summer, when the Sun is in Leo, for before that time the people say it doth not come to maturity, and after the worm from which they draw the Cochineal makes an hole in the leaf in which it grows, it is lost. The Persians call Cochineal *Kirmes* from *Kirm*, which signifies a worm, because it is extracted out of worms”.

For my own part too, it may not be improper to acquaint you, I have used the term *Cochineal* in all these letters, as it is understood by the Spaniards, in a general sense; and although I have no room to doubt the Grass Insect is a new genus, the term is not less necessary for conveying any idea, to persons who have not made this subject a particular study, and being still of opinion this Insect may be brought forward as a new article of Trade, and the identical species of *Cochineal* of Mexico discovered in this Peninsula, I have induced several of my friends on different parts of the coast to make plantations of *Opuntia*, whom I furnish with copies of all the letters I write you, as well as some in Bengal and Bombay, that no time may be lost in forwarding this work, which I hope will meet your approbation, by being made public in Europe.

And I take this opportunity of the departure of a Danish Ship, *The Treasurer*, to write you, as well as to transmit copies of my former letters, by Captain Cox of this Establishment, who goes to Europe a passenger on board, lest any accident should have prevented the originals coming to your hand.

The Species of *Opuntia* I am cultivating, is the *Opuntia Major Folio Oblongo Rotundo, Spinis longissimis et validissimis confertim nascentibus, Flore luteo*, described in Sir Hans Sloane's second Vol. of the Hist. of Jamaica, pages 149, 150, 151 and 152, excepting that the Prickles are perfectly straight, and the outward *Petals* of the Flower red on the outside, so that when blown it appears like a yellow Rose, *Striis Rubris Variegatis*.

In regard to the Flower, it approaches nearer Sir Hans Sloane's next species page 152, which I observe Linnæus has omitted, and taken his description of the Cactus Cochinitifer, *Flore Sanguineo*, from Dillenius.

It

It grows wild every where in this neighbourhood, and in *Coimbatour*, the cultivated fields are inclosed with it, as well as the gardens about *Pondicherry*; which is the only use to which the natives here apply it, who believe no serpent can live near it.

I have no doubt it is the same plant as the *Tuna* of Mexico, which Doctor Ruffell assures me Doctor Allston at Edinburgh, and Mr. Geoffroy at Paris, believed on the authority of Doctor Moultrie, and Doctor Houston, to be the *Cactus Cochinifer*, but whether by Culture it may be brought to the exact description of the *Tuna Mitior* of Plukinet Sir Hans Sloane and Dellinius, or whether the *Nopal* of Mexico is a Distinct species of *Opuntia*, time must determine.

The product of the *Chlocooth* or grass Insect being a *Pompadouré* or *Capuchin* Colour so much esteem'd as sometimes to become the general fashion may entitle it to be collected, and the prospect of rearing Cochineal in this Peninsula in addition to the Trade of Great Britain induces me to have these letters printed for the purpose of a more extensive communication than could be supported in writing.

I am with much Esteem,

Fort St. George

Dear Sir,

Apr. 26th 1787.

Your very Obedient

Humble Servant

JAMES ANDERSON.

F I N I S.

