

To Dr Benjamin Franklin

[429]

Soho Square

7 November 1783

Dear Sir

Yesterday Evening I open'd the Session of the Royal Society by reading to them your two Communications upon the subject of the Aerostatique Machines lately executed in France & I can Assure you without Flattery that an Evident pleasure was visible in the manner in which they receiv'd your return (as they Consider'd it) to Philosophical amusements after having so long being detain'd from them by business so inimical to Science<sup>1</sup>

Whether you would chuse to have these Essays printed in the Philosophical transactions is a Question to which I should be much Oblig'd to you for an answer the reason against it is that during the Long Vacation of the Society the business is much more develop'd than it was when you Communicated the reason why they should be printed is that as far as they go they are distinctly & well written in short unless you intend to Amuse your Leisure by giving some more general detail of what has been done on this subject I should have no doubt of the propriety of Printing them & will answer for the readiness of the Commēe of Papers to give their approbation

Beleve me there are many here who would rejoice to see you again in your old haunts to which I do not doubt you feel some inclination to return & none more than

Your Faithfull Servant

Jos: Banks

We are told by the news papers that a Ballon has been let fly from London I know nothing relative to the particulars but I think I see an inclination in the more respectable part of the R.S. to guard against the Ballomania which has prevail'd in & not to patronise Ballons merely on account of their rising in the atmosphere till some experiment likely to prove beneficial either to Society or Science is propos'd to be annex't to them

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1. For Franklin's accounts of ballooning, see Franklin to Banks, 30 November 1783 and Banks to Franklin, 8 October 1783, letters 440 and 401, this volume.

## From Dr Benjamin Franklin

[436]

Passy

21 November 1783

Dear Sir,

I received your friendly Letter of the 7<sup>th</sup> Inst. I am glad my */giving an Account of/ /Letters/* respecting the */Balloons/ /Aerostatic Experiment/* were not unacceptable. But as more perfect Accounts of the Construction and Management of that Machine have been and will be publish'd before your Transactions, and from which Extracts may be made */or an Account drawn/* that will be more particular & therefore more satisfactory, I think it best not to print those Letters. I say this in answer to your Question: */for I did not indeed write them with a View of their being inserted/*. M. Faujas de St. Fond acquainted me yesterday, that a Book on the Subject which has been long expected, will be publish'd in a few Days, and I shall send you one of them. Enclos'd is a Copy of the *Procés verbal* taken of the Experiment made yesterday in the Garden of the Queen's Palace la Muette */where the Dauphin now resides,/* which being near my */House/* I was present, */and so shall add a few Circumstances/* This Paper */being/ /was/* drawn up hastily, */&/* may in some Places */be/* appear to you obscure; */without Explanation/* therefore I shall add a few explanatory Observations.

This [deletions] */Balloon* was larger than that which */* went up from Versailles, & carried the Sheep, &c. Its Bottom was open, and in the middle of the Opening was fix'd a kind of Basket Grate in which Faggots and */Sheaves of/* Straw were burnt. The [deletion] Air rarified in passing thro' this Flame rose in the Balloon, swell'd out its Sides & fill'd it.

The [numeral obscured]<sup>1</sup> Persons who were plac'd in the Gallery */had an/ /made of Wicker, and attach'd to/* the Outside */near the Bottom,/* had each of them a Post thro' which they could pass Sheaves of Straw into the Grate to keep up the Flame, & thereby keep the Balloon full. When it went over our Heads, we could see the Fire which was very considerable. */When/ /As/* the Flame slackens, the rarified Air cools & condenses, the Bulk of the Balloon diminishes and it begins to descend. If those in the Gallery see it likely to descend in an improper Place they can, by throwing on more Straw, & renewing the Flame, make it rise again, and the Wind carries it farther. –

*La Machine poussée par le Vent s'est dirigée sur une des Allées du Jardin.* That is, against the Trees of one of the Walks. The Gallery hitch'd among the */top/* Boughs of those Trees which had been cut, */and were stiff, while/* the Body of the Balloon lean'd */over/ /beyond/* & seem'd likely to overset. I was */then/* in great Pain for the Men, thinking them in danger of being thrown out, or burnt; for I expected that the Balloon being no longer upright, the Flame would have

laid hold of the Inside that lean'd over it. But by means of some Cords that were still attach'd to it, it was /soon/ brought upright again, made to descend, & carried back to its place. It was however much damag'd.

*Planant sur l'Horizon.* When they were as high as they chose to be, they made less Flame, and suffer'd the Machine to drive horizontally with the Wind, of which however they felt very little, as they went with it, and as fast. They say they had a charming View of Paris & its Environs, the Course of the River, &c. but that they were once /once/ lost, not knowing what Part they were over, till they saw the Dome of the Invalids, which rectified their Ideas. Probably while they were employ'd in keeping up the Fire, the Machine might turn, and by that means they were *disorientés* as the French call it.

[deletion] There was a vast Concourse of Gentry in the Garden, who had great Pleasure on Seeing the Adventurers go off so chearfully, & applauded them by clapping, &c. but there was at the same time a good deal of Anxiety for their Safety. Multitudes in Paris saw the Balloon passing; but /did not know there were Men with it,/ it /was/ /being/ then so high that they could not see them.

*Devélopant du Gaz.* That is, in plain English, *burning more Straw; /of which/* for tho' there is a little Mystery made, concerning the kind of Air with which the Balloon is fill'd, I conceive is to be nothing more than /hot Smoke or/ common Air rarified, – tho' in this I may be mistaken. –

*Ayant encore dans leur Galerie le deux tiers de leur approvisionnement.* That is, their Provision of Straw; of which they carried up a great Quantity. It was well that in the hurry of so hazardous an Experiment, the Flame did not happen by any accidental Mismanagement to lay hold of this Straw; tho' each had a Bucket of Water by him, by way of Precaution.

One of these courageous Philosophers, the Marquis /d'Arlandes,/ did me the Honour to call upon me in the Evening after the Experiment /with M<sup>r</sup> Montgolfier the very ingenious Inventor/. I was /very/ happy to see him safe. /He inform'd me/ they lit gently without the least Shock, and the Balloon was very little damag'd.

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1. The smudged number appears to be 4 or 6.

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To Dr Benjamin Franklin

[437]

Soho Square

28 November 1783

Dear Sir

I am in truth much indebted to you for the favor you have done me in transmitting the Copy of the Procès verbal /on M. Montgolfiers experiment/ which I have this moment receivd The Experiment becomes now interesting in no small degree I laught when Ballons of scarce more importance than soap bubbles occupied the attention of France but when men Can with safety pass & do pass more than 5 miles in the first Experiment I begin to fancy that I espy the hand of the Master in the Education of the infant of Knowledge who so speedily attains /such/ a degree of maturity & do not scruple to guess my old Friend who usd to assist me when I was younger has had some share in the success of the enterprise

On Tuesday last a miserable Taffeta Ballon was /raisd/ let loose here under the direction of a M<sup>r</sup> Zambeccari /an Italian nobleman as I hear/ it was 10 feet in diameter & filld with inflammable air made from the filings of Iron & Vitriolic acid the silk was Oild & the seams coverd with Tar & the outside Gilt it had been shewn for several days floating about in a public room at a shilling for the sight & half a crown for the Admission when it should be let loose

The day was fine to Excess the wind a gentle breeze from the North at a few minutes after one it set out & before night fell at Grafham a small village near Petworth in Sussex having ran over about 48 miles of Countrey the Countreyman who first saw it observd it in its descent it appeard at first small & increasing fast surprizd him so much that he ran away he returnd however & found it burst by the expansion of the Containd fluid

I wish I had somewhat more interesting to tell you of but I am at this moment risen from the dinner which I annualy give to the auditors of the treasurers account I would not delay my thanks to you and I trust you will make some allowance for the Effects of the festivity of the day which has I fear Cramp'd my Accuracy but I can assure you has not diminsd the real gratitude with which I declare myself

Your Obligd

& Faithfull Servant

Jos: Banks

To Dr Benjamin Franklin

[446]

Soho Square

9 December 1783

Dear Sir

The Friendship which I have experienced from you in your so speedily sending me Accounts of the Progress of the new Art of Flying which makes such rapid advances in the Countrey you now inhabit I beg to acknowledge with real gratitude I wish I had more than gratitude something to Communicate in return but times must Come when I shall be able to repay the debt which you have accumulated upon me with so much Friendly perseverance & beleive me I shall do it with a grateful pleasure

Charles's Experiment seems decisive & must be performd here in its full extent I have hitherto been of Opinion that it is unwise to struggle for the honor of an invention which is about to be Effected Practical Flying we must allow to our rivals Theoretical Flying we claim /ourselves/ Bishop Wilkins in his Mechanical magic has I am informd (for I have not yet got the book) a proposal for flying by means of a vessel filld with rare Air & M<sup>r</sup> Cavendish when he blew soap bubbles of his Inflammable air evidently performd the /experiment/ which Carried Charles the memorable flight of the 1<sup>st</sup>. instant when our Friends on your side of the water are coold a little however they shall see that we will visit the repositories of stars & meteors & try if we cannot derive as much Knowledge by application of Theory to what we find in the Armories of heaven as they can do

M<sup>r</sup> Mitchell has given us a very curious paper in which he considers light as subject to the power of /attraction/ /gravitation/ like all other bodies<sup>1</sup> if says he should there be any material difference in the magnitude of the Fixd Stars the light of the Large ones would move more slowly & in consequence be liable to a different refraction from that of the smaller ones but no such thing can be Observd with our best Telescopes we have scarce a right to judge them not varying from each other in any immense quantity of magnitude for was any one to be 100 times larger than another the difference would be discernable

A miserable Comet made his appearance to M<sup>r</sup> Nathan Pigot in his Observatory in Yorkshire on the 19 & the weather has been so hazy in the evenings that it has scarce been Observd since it was on the

				<u>Right Ascen</u>		<u>North dec</u>
19	at	11 <sup>h</sup> : 15'	-	41° - 0' - 0"	-	3° - 1'
20	-	10 : 54'	-	40° - 0' - 0"	-	4° - 3'
21	it was seen in the place it was expected but the night was too hazy to observe it					

it appears like a Nebula, with a diameter of About 2 minutes of a degree the nucleus for it is seen with difficulty when the wires of the instrument are illuminated but it is not visible with an opera glass<sup>2</sup>

M<sup>r</sup> Pigot

Nov<sup>r</sup> 29 it was seen near the Chin of Aries it appeared like a nebulous Star as there was so much moon light it was difficult to find it

Dec<sup>r</sup> 1 it was removed near the preceding Eye of Aries but conceiving other astronomers who have fixed instruments have noted its place he has not calculated the distance from any Known

M<sup>r</sup> Herschell

We are told that a Man has prepared Wings at a very considerable expence indeed they say £1000 [and] that the models upon which they are constructed have flown & that the reality now in London but packed up in a Box should by a comparative calculation carry 150lb more than the man the machine consists of 4 wings two of which beat while the other two are drawn back some people whose opinion in mechanics is looked upon as Authority have said that they must succeed Credat Judeus say I I must see it before I believe it

I am dear Sir  
with real gratitude  
& sincere thanks  
Yours Faithfully  
Jos: Banks

I open this to thank you for M<sup>r</sup> Faujas's book which I received this moment on my return home from dinner

[Addressed: Passy, Paris.]

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1. Banks referred to a paper by John Michell in the *Philosophical Transactions*: 'On the means of discovering the distance, magnitude, &c. of the fixed stars, in consequence of the diminution of the velocity of their light, in case such a diminution should be observed', *PT*, 74 (1784). This is the famous 'black hole' paper in which Michell suggested that if a star is massive enough for its escape velocity to exceed the velocity of light, its light will not reach us.

2. See Nathaniel Pigott, 'An observation of a meteor of August 18th, 1783, made on Hewitt Common, near York', *PT*, 74 (1784).