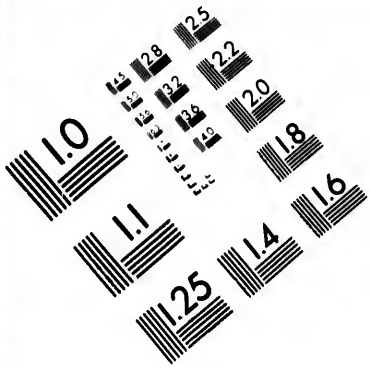

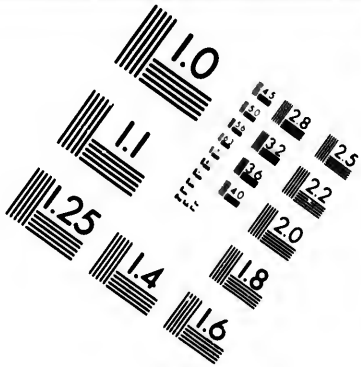

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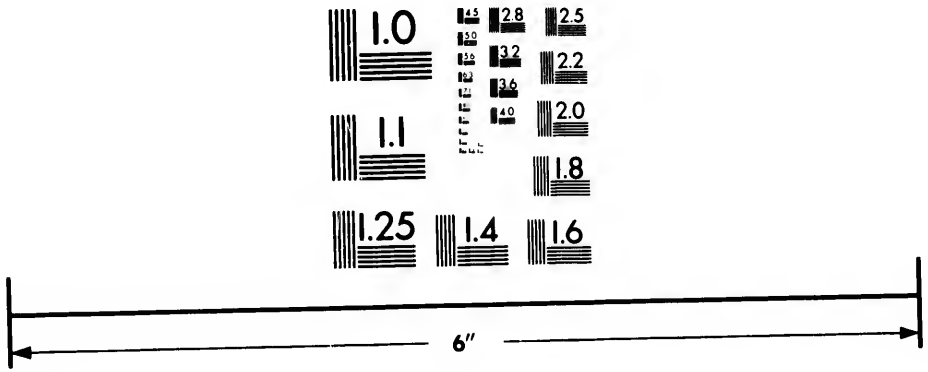

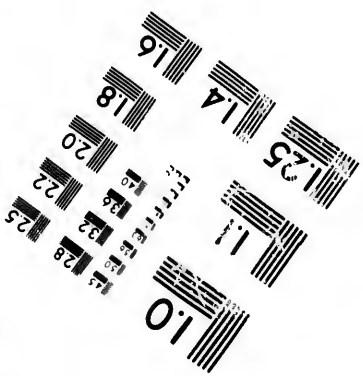

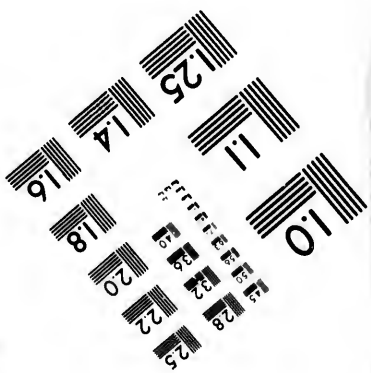

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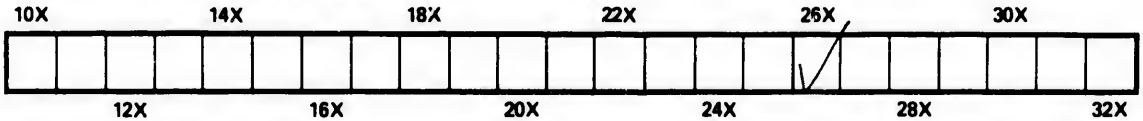
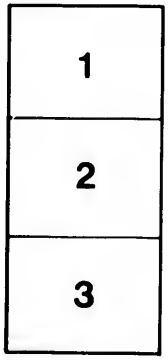
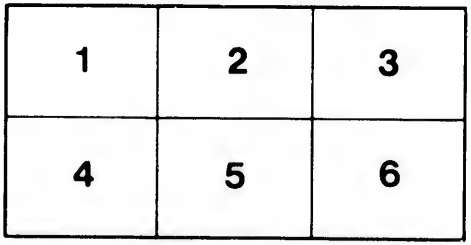






THE PROBABILITY OF REACHING THE NORTH POLE DISCUSSED.

[Price Two Shillings and Six Pence.]

THE

PROBABILITY

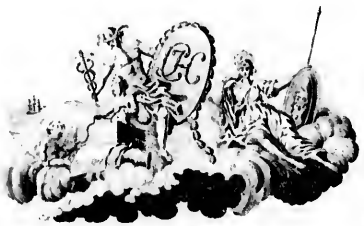
OF REACHING

THE NORTH POLE

DISCUSSED.

. . . . . Nec sit terris
Ultima Thule. . . . . .

SENECA in Medea.



LONDON,
Printed for *C. HEYDINGER*, in the STRAND.
M. DCC. LXXV.

INSTANCES OF NAVIGATORS WHO HAVE REACHED HIGH NORTHERN LATITUDES.

Read at a Meeting of the Royal Society, May 19, 1774.

AS I was the unworthy propoſer of the voyage towards the North Pole, which the Council of the Royal Society recommended to the Board of Admiralty, I think it my duty to lay before the Society ſuch intelligence as I have happened to procure with regard to navigators having reached high Northern latitudes[a]; becauſe ſome of theſe accounts ſeem to promiſe, that we may proceed further towards the Pole than the very able Officers, who were ſent on this deſtination laſt year, were permitted to penetrate, notwithſtanding their repeated efforts to paſs beyond eighty degrees and an half.

I ſhall begin, however, by making an obſervation or two with regard to the Greenland fiſhery, which will in a great meaſure account for our not being able to procure

(a) It is well known that there are many ſuch accounts in print, but to theſe I need not refer the Society.

procure many inſtances of nearer approaches to the Pole, than the Northern parts of Spitzbergen.

Fifty years ago ſuch apprehenſions were entertained of navigating even in the looſe, or what is called *failing ice*, that the crews commonly continued on ſhore, from whence they only purſued the whales in boats.

The demand, however, for oil increaſing, whilſt the number of fiſh rather decreaſed, they were obliged to proceed to ſea in queſt of them, and now by experience and adroitneſs ſeldom ſuffer from the obſtructions of ice (b).

The maſters of ſhips, which are employed in this trade, have no other object but the catching as many whales as poſſible, which as long as they can procure in more Southern latitudes, they certainly will not go in ſearch of at a greater diſtance from the port to which they are to return: they therefore ſeldom proceed beyond N. lat. 80, unleſs driven by a ſtrong Southerly wind, or other accident.

Whenever this happens alſo, it is only by very diligent inquiries that any information can be procured; for the maſters, not being commonly men of ſcience, or troubling their heads about the improvement of geographical knowledge, never mention theſe circumſtances on their return, becauſe they conceive that no one is more intereſted about theſe matters than they are themſelves.

(b) Theſe particulars I received from Captain Robinſon, whom I ſhall have hereafter occaſion to mention.

themſelves. Many of the Greenland maſters are likewiſe directed to return after the early fiſhery is over, provided they have tolerable ſucceſs; ſo that they have no opportunity of penetrating to the Northward.

To theſe reaſons it may be added, that no ſhips were perhaps ever ſent before laſt ſummer with expreſs inſtructions to reach the Pole, if poſſible, as moſt other attempts have been to diſcover a N. E. or N. W. paſſage, which were ſoon defeated by falling in with land.

Having thus endeavoured to ſhew that the inſtances of ſhips reaching high Northern latitudes muſt neceſſarily be rare, I ſhall now proceed to lay before the Society, ſuch as I have been able to hear of ſince the voyage towards the N. Pole was undertaken during laſt ſummer.

When this was determined upon, and mentioned in the News Papers, it became matter of converſation amongſt the crews of the guardſhips, and Andrew Leekie, an intelligent ſeaman on board the Albion (then ſtationed at Plymouth), informed ſome of the officers that he had been as far North as $84\frac{1}{2}$.

When he was aſked further on this head, he ſaid that he was on board the Reading, Captain Thomas Robinſon, in 1766, and that whilſt he was ſhaving the captain, Mr. Robinſon told him that he had probably never been ſo far to the Northward before, as they had now reached the above mentioned degree of latitude.

Having happened to hear this account of Leekie's, on my return to London this winter, I found out Captain Robinſon, who remembered his having had this con-

verſation with Leekie, but ſaid that he was miſtaken in ſuppoſing that they had reached 84½ N. lat. as they were only in 82½.

Captain Robinſon then explained himſelf, that he had at this time computed his latitude by the run back to Hakluyt's Headland in 24 hours; from which, and other circumſtances mentioned in my preſence before two ſea officers, they told me afterwards that they had little or no doubt of the accuracy of his reckoning. Mr. Robinſon likewiſe remembers that the ſea was then open, ſo that he hath no doubt of being able to penetrate to 83, but how much further he will not pretend to ſay.

This ſame captain, in the ſhip St. George, was, on the 15th of June 1773, in N. lat. 81° 16′, by a very accurate obſervation with an approved Hadley's quadrant, in which he alſo made the proper allowance for the refraction in high Northern latitudes, at which time ſeeing ſome whales ſpouting to the Northward, he purſued them for five hours, ſo that he muſt have reached 81½, when the ſea was open to the Weſtward and E.N.E. as far as he could diſtinguiſh from the maſt-head. His longitude was then 8 degrees E. from the meridian of London.

Captain Robinſon is a very intelligent ſeaman, and hath navigated the Greenland ſeas theſe twenty years, except during the interval that he was employed by the Hudſon's Bay Company (c).

I could

(c) He lived during this winter in Queen-ſtreet, near Greenland-dock, Rotherhithe: he hath ſailed, probably, by this time on the Greenland fiſhery.

With

I could add ſome other, perhaps intereſting, particulars, which I have received from Captain Robinſon, with regard to Spitzbergen and the Polar ſeas; I will only mention, however, that he thinks he could ſpend a winter not uncomfortably in the moſt Northern parts we are acquainted with, as there are three or four ſmall ſettlements of Ruſſians in Spitzbergen for the ſake of the ſkins of quadrupeds, which are then more valuable, than if the animal is taken in ſummer.

The next inſtance I ſhall mention of a navigator who hath proceeded far Northwards is that of Captain Cheyne, who gave anſwers to certain queries drawn up by Mr. Dalrymple, F. R. S. in relation to the Polar ſeas, and which were communicated laſt year to the Society.

Captain Cheyne ſtates in this paper, that he hath been as far as N. lat. 82, but does not ſpecify whether by *obſervation* or his *reckoning*, though from many other anſwers to the interrogatories propoſed, it ſhould ſeem that he ſpeaks of the latitude by *obſervation*. Unfortunately Captain Cheyne is at preſent on the Coaſt of Africa, ſo that further information on this head cannot be now procured from him.

Whilſt the ſhips deſtined for the N. Pole were preparing, a moſt ingenious and able ſea officer, Lieutenant John Cartwright, told me that twelve years ago he had been informed of a very remarkable voyage made by Captain Mac-Callam as far nearly as 84 N. lat.

This

With regard to his having been in N. lat. 81° 30′, in June 1773, he can prove it by his journal, if that evidence ſhould be required.

This account Mr. Cartwright had received from a brother officer, Mr. James Watt, now a lieutenent in the Royal Navy, who was on board Captain Mac-Callam's ſhip.

I thought it my duty to acquaint the Admiralty with this intelligence, who would have ſent for Mr. Watt, but he was then employed on the coaſt of America.

On his return from thence within the laſt month, Mr. Cartwright introduced a converſation with regard to Captain Mac-Callam's voyage, when Mr. Watt repeated all the circumſtances which he had mentioned to him twelve years ago; after which Mr. Cartwright, thinking that I ſhould be glad to hear the particulars from Mr. Watt himſelf, was ſo good as to bring him to my chambers, when I received from him the following information:

In the year 1751 Mr. Watt, then not quite ſeventeen years of age, went on board the Campbeltown of Campbeltown, Captain Mac-Callam, which ſhip was at that time employed in the Greenland fiſhery.

It ſeems that during the time the whales are ſuppoſed to copulate, the crews of the Greenland veſſels commonly amuſe themſelves on ſhore.

Captain Mac-Callam however (who was a very able and ſcientific ſeaman) thought that a voyage to the N. Pole would be more intereſting, and that the ſeaſon being a fine one, he had a chance of penetrating far to the Northward, as well as returning before the later fiſhery took place. He accordingly proceeded without

the leaſt obſtruction to $83\frac{1}{2}$, when the ſea was not only open to the Northward, but they had not ſeen a ſpeck of ice for the laſt three degrees, and the weather at the ſame time was temperate; in ſhort Mr. Watt hath never experienced a more pleaſant navigation.

It need be ſcarcely obſerved, that the latitude of $83\frac{1}{2}$ was determined by obſervation, as the great object of the voyage was to reach the Pole; the Captain therefore, the mate, and young Mr. Watt, determined the latitude from time to time, both by Davis and Hadley's quadrants: to this I may add, that their departure and return were from and to Hakluyt's Headland.

When they were advancing into theſe high Northern latitudes, the mate complained that the compaſs was not ſteady, on which Captain Mac-Callam deſiſted from his attempt, though with reluctance; knowing that if any accident happened, he ſhould be blamed by his owners, who would be reminded certainly by the mate of the proteſts he had made againſt the ſhip's proceeding further Northward.

Several of the crew however were for proſecuting their diſcoveries, and Mr. Watt particularly remembers the chagrin which was expreſſed by a very intelligent ſeaman, whoſe name was John Kelly; Captain Mac-Callam alſo, after his return from that voyage, hath frequently ſaid, in the preſence of Mr. Watt and others, that, if the mate had not been faint-hearted, the ſhip poſſibly might have reached the pole.

Both

Both Captain Mac-Callam and the mate are now dead, and it is rather doubtful whether the ſhip's journal can be procured.

It remains therefore to be conſidered what may be objected to the credibility of this very intereſting account.

I have ſtated that Mr. Watt was not at the time this voyage took place quite ſeventeen years of age, but I have alſo ſtated that he obſerved himſelf (as well as the maſter and mate), from time to time. Is it therefore more extraordinary he ſhould remember with accuracy that, two and twenty years ago, he had been in N. lat. $83\frac{1}{2}$, than that at the ſame diſtance of time, he might recollect that he had been at a friend's houſe which was ſituated 83 miles and an half from London? Or rather indeed is not his memory, with regard to this high latitude, much more to be depended upon, as the circumſtance is ſo much more intereſting?

To this I may add, that it being his firſt voyage, and ſo remarkable a one, Mr. Watt now declares that he remembers more particulars relative to it, than perhaps in any other ſince that time; Mr. Watt alſo being of a ſcientific turn, the high Northern latitude was likely to make a more ſtrong impreſſion upon him: other ſea officers have likewiſe told me, that the circumſtances of their firſt voyages are moſt freſh in their memory, the reaſon for which is too obvious to be dwelt upon.

If Mr. Watt's recollection however is diſtruſted, this objection extends equally to Captain Mac-Callam's frequent declarations, that, if the apprehenſions of the mate

mate had not prevented, he might poſſibly have reached the N. Pole; and how could he have conceived this, unleſs he had imagined himſelf to have been in a very high Northern latitude?

But it may be poſſibly ſaid, that this voyage took place above twenty years ſince, and that therefore at ſuch a diſtance of time no one's memory can be relied upon.

It is true indeed that Mac-Callam made this attempt in 1751, but Mr. Watt continued his ſervices the following year in a Greenland ſhip, and therefore, traverſing nearly the ſame ſeas, muſt have renewed the recollection of what he had experienced in the preceding voyage, though he did not then penetrate further than N. lat. 80.

This however brings it only to 1752, but I have already ſtated, that within theſe twelve years he mentioned all the particulars above related to his brother officer, Lieutenant Cartwright.

Mr. Watt alſo frequently converſed with Captain Mac-Callam about this voyage after both of them had quitted the Greenland ſhips; Mr. Watt riſing regularly to be a Lieutenant in his Majeſty's ſervice, and Captain Mac-Callam becoming Purſer of the Tweed man of war.

It ſo happened that in the year of the expedition againſt Belleiſle, Mr. Watt, Captain Mac-Callam, and Mr. Walker (commonly called Commodore Walker, from his having commanded the Royal Family privateers

teers in the late war) met together at Portſmouth, when they talked over the circumſtances of this Greenland voyage, which Mr. Walker was intereſted in, by having been the principal owner of the Campbeltown.

Mr. Watt's memory was therefore again refreſhed with regard to all theſe circumſtances: Mr. Walker is indeed now in Spain, but is expected to return very ſoon, which if he ſhould do, I will not fail to lay an account before the Society of the converſation which then paſſed at Portſmouth.

Mr. Watt and Captain Mac-Callam met alſo eleven years ago in London, when they as uſual converſed about the having reached ſo high a Northern latitude.

I now come to my laſt proof, which I received from Dr. Campbell, the able continuator and reviſer of Harris's Collection of Voyages.

In that very valuable compilation, Commodore Roggewein's circumnavigation makes a moſt material addition, ſome of the moſt intereſting particulars of which were communicated by Dr. Daillie, who was a native of Holland [d], and lived in Racquet-court, Fleet-ſtreet, about the year 1745, where he practiſed phyſick.

Dr. Campbell went to thank Daillie for the having furniſhed him with Commodore Roggewein's voyage, when Daillie ſaid that he had been further both to the Southward

(d) He was a grandſon of Daillie, who was author of a book, much eſteemed by the Divines, entitled "*De Uſu Patrum.*"

Southward and to the Northward than perhaps any other perſon who ever exiſted.

He then explained himſelf as to the having been in high Southern latitudes, by ſailing in Roggewein's fleet (e), and as to his having been far to the Northward, he gave the following account:

Between fifty and ſixty years ago it was uſual to ſend a Dutch ſhip of war to ſuperintend the Greenland fiſhery, though it is not known whether this continues to be a regulation at preſent.

Dr. Daillie (then young) was on board the Dutch veſſel employed on this ſervice (f), and during the interval between the two fiſheries, the Captain determined, like Mr. Mac-Callam, to try whether he could not reach the Pole, and accordingly penetrated (to the beſt of Dr. Campbell's recollection) as far as N. lat. 88, when the weather was warm, the ſea perfectly free from ice, and rolling like the bay of Biſcay. Daillie now preſſed the Captain to proceed, but he anſwered that he had already gone too far by having neglected his ſtation, for which he ſhould be blamed in Holland, on which account alſo he would ſuffer no journal to be made, but returned as ſpeedily as he could to Spitzbergen.

There are undoubtedly two objections which may be made to this account of Dr. Daillie's, which are, that

(e) Roggewein reached S. lat. 62° 30'. See Harris.

(f) Dr. Campbell does not recollect in what capacity he ſerved, but, as he afterwards practiſed phyſick, he might probably have been the ſurgeon.

it depends not only upon his own memory, but that of Dr. Campbell, as no journal can be produced, for the reaſon which I have before ſtated.

The converſation between Dr. Campbell and Daillie aroſe from the accidental mention of Roggewein's voyage to the Southward; and can it be ſuppoſed that Daillie invented this circumſtantial narrative on the ſpot, without having actually been in a high Northern latitude?

If this be admitted to have been improbable, was he not likely to have remembered with accuracy what he was ſo much intereſted about, as to have preſſed the Dutch Captain to have proceeded to the Pole?

But it may be ſaid alſo that we have not this account from Daillie himſelf, but at ſecond hand from Dr. Campbell, at the diſtance of thirty years from the converſation.

To this it may be anſwered, that Dr. Campbell's memory is moſt remarkably tenacious, as is well known to all thoſe who have the pleaſure of his acquaintance; and, as he hath written ſo ably for the promotion of geographical diſcoveries in all parts of the globe, ſuch an account could not but make a ſtrong impreſſion upon him, eſpecially as he received it juſt after the firſt edition of his compilation of voyages.

No one eaſily forgets what is highly intereſting to him; and, though I do not pretend to have ſo good a memory as Dr. Campbell, I have ſcarcely a doubt, but that if I ſhould live thirty years longer, and retain my

faculties, I ſhall recollect with preciſion every latitude which I have already ſtated in this paper.

What credit, however, is to be given to all theſe narratives is entirely ſubmitted to the Society, as I have ſtated them moſt fully with every circumſtance which may invalidate, as well as ſupport them; and if I have endeavoured to corroborate them by the obſervations which I have made, it is only becauſe I believe them.

It ſhould ſeem upon the whole of the inquiries upon this point, that it is very uncertain when ſhips may penetrate far to the Northward of Spitzbergen, and that it depends not only upon the ſeaſon, but other accidents, when the Polar ſeas may be ſo free from ice as to permit attempts to make diſcoveries (g).

Poſſibly, therefore, if a king's officer was ſent from year to year on board one of the Greenland ſhips, the lucky opportunity might be ſeized, and the Navy Board might pay for the uſe of the veſſel, if it was taken from the whale fiſhery, in order to proceed as far as may be towards the North Pole.

(g) Captain Robinſon hath informed me, that at the latter end of laſt April, a Whitby ſhip was in N. lat. 80, without having been materially obſtructed by the ice.

DAINES BARRINGTON, F.R.S.

ADDITIONAL

PROOFS

THAT

THE POLAR SEAS

ARE OPEN.

Read at a Meeting of the Royal Society, Dec. 22, 1774.

ADDITIONAL

PROOFS, &c.

Read at a Meeting of the Royal Society, Dec. 22, 1774.

AS I happen to have collected many additional facts ſince my paper, containing Inſtances of Navigators who had reached high Northern Latitudes, was read before the Society in May laſt, I ſhall take the liberty to ſtate them according to chronological order; together with ſome general reaſons why it may be preſumed, that the Polar ſeas are, at leaſt ſometimes, navigable.

I think it my duty to do this, not only becauſe I was the unworthy propoſer of the Polar voyage in 1773, which was recommended by the Council of the Royal Society to the Board of Admiralty; but becauſe it would not redound much to the credit of the Society, if they planned a voyage to reach the N. Pole, if poſſible, when a perpetual barrier of ice prevented any diſcoveries in the Spitzbergen ſeas to the Northward of $80\frac{1}{2}$, which is not a degree beyond the moſt common ſtation of the Greenland fiſhers.

I muſt here, however, repeat, that no one is more entirely ſatisfied than myſelf of the great abilities, perſeverance, and intrepidity, with which the officers who were ſent on this deſtination, attempted to proſecute their diſcoveries; but I conceive, from the arguments and facts which will follow, that they were ſtopped by a moſt unfortunate barrier of ice (of great extent indeed), but which was only temporary, and not perpetual.

If ſuch a wall of ice hath been conſtantly fixed in this latitude, and muſt continue to be ſo, there is an end to all diſcoveries to be made to the Northward of Spitzbergen; but if it is only occaſional, the attempt may be reſumed in ſome more fortunate year.

The point therefore being of ſo much importance to geography, I hope the Society will pardon me, if I more fully enter into the ſubject than I did in my former paper.

The Engliſh have long taken the lead in geographical diſcoveries. One of our ſhips of war is lately returned after having penetrated into the Antarctic circle; and is it not rather a reflection upon a ſcientific nation, that more is not known with regard to the circumpolar regions of our own hemiſphere, than can be collected from maps made in the time of Charles I. eſpecially when the run from the mouth of the Thames to the N. Pole is not a longer one, than from Falmouth to the Cape de Verde iſlands?

Though

Though I have the honour to be a Fellow of a Society inſtituted for the promotion of Natural Knowledge, the prejudices of an Engliſhman are ſo ſtrong with me, that I cannot but wiſh the diſcoveries to be made in the Polar ſeas may be atchieved by my countrymen; but if we are determined to abandon the enterprize, ſcience is to be honoured from whatever quarter it may come, and it hath therefore given me great ſatisfaction to hear, that Monſ. de Bougainville is ſoon to be ſent on diſcoveries to the Northward.

In the outſet of my former paper, I ſaid I ſhould not trouble the Society with any inſtances of navigators having reached high Northern latitudes, which had appeared in print. During the courſe of this ſummer, however, I have happened to find three ſuch accounts, which were never before alluded to, and which are extracted from books that are not commonly looked into, or at leaſt often conſulted upon points of geography.

When the Royal Society was firſt inſtituted, it was uſual to ſend queries to any traveller who happened to reſide in England, after having been in parts of the world which are not commonly frequented.

In the year $166\frac{2}{3}$, Mr. Oldenburg, then ſecretary of the Society, was ordered to regiſter a paper, entitled, "Several Inquiries concerning Greenland, anſwered "by Mr. Grey, who had frequented thoſe parts."

The 19th of theſe queries is the following:

"How near any one hath been known to approach "the Pole?"

Anſwer. "I once met upon the Coaſt of Greenland, "a Hollander, that ſwore he had been but half a de- "gree from the Pole, ſhewing me his journal, which "was alſo atteſted by his mate; where they had ſeen "no ice or land, but all water."

After which Mr. Oldenburgh adds, as from himſelf, "This is incredible[a]."

It may not be improper therefore, after mentioning this firſt inſtance of a navigator's having approached ſo near to the Pole, to diſcuſs upon what reaſons Mr. Oldenburgh might found this his very peremptory incredulity.

Was it becauſe the fact is impoſſible upon the very ſtating it?

This puts me in mind of the incredulity which is generally ſhewn to a paſſage in Pliny, even after the actual fact hath ſhewn not only the poſſibility, but eaſy practicability of what is alluded to. Pliny informs us[b], that Eudoxus flying the vengeance of king Lathyrus

(a) See Dr. Birch's Hiſtory of the Royal Society, vol. I. p. 202. Theſe queries are nineteen in number, to which the anſwers are very circumſtantial. I had an opportunity of reading them over to three very intelligent maſters of Greenland ſhips, who confirmed every particular. One circumſtance I think it right to take notice of, though it does not immediately relate to the point in diſcuſſion, which is, that there are coals in Spitzbergen, by which ſeven of Mr. Grey's crew were enabled to bear the ſeverity of the winter, having been left behind by an accident. One of the Greenland maſters, to whom I read Mr. Grey's anſwers, confirmed this particular; ſaying, that he had burnt himſelf Spitzbergen coals, and that they were very good.

(b) L. II. ch. 67.

rus ſailed from Arabia, and reached the Straits of Gibraltar: yet no one ſcarcely will believe this account of Eudoxus's navigation, notwithſtanding this courſe is ſo often followed.

Was it becauſe no Engliſhman had then been ſo far to the Northward?

It is very eaſy, however, to account why ſuch attempts ſhould rather be made by the Dutch than the Engliſh, in the infancy of the Greenland fiſhery.

The Southern parts of this country were diſcovered by Sir Hugh Willoughby, A. D. 1553; after which, no Engliſh ſhips were ſent on that coaſt for nearly fifty years. In the beginning of the laſt century, however, a competition aroſe between the Engliſh and Dutch, with regard to the whale fiſhery, and the Engliſh drove the Dutch from moſt of the harbours, under the right of firſt diſcoverers, in which they were ſupported by royal inſtructions; ſo that the Dutch were obliged to ſeek for new ſtations, whereas the Engliſh were commonly in poſſeſſion of the Greenland ports, which they conſidered as their own(c).

Did Mr. Oldenburgh diſbelieve the Dutchman's relation, becauſe ice is frequently met with to the Southward of N. lat. 80?

Ice

(c) See Purchas, *paſſim*. Whilſt theſe diſputes continued, the Dutch often ſent ſhips of war to protect their Greenland traders, which accounts for Dr. Daillie's ſailing in ſuch a veſſel to 88, as I have ſtated in my former paper

Ice is commonly ſeen upon the great bank of Newfoundland, and the harbour of Louiſburgh is often covered with it, which is only in N. lat. 46; yet Davis and Baffin have penetrated, under nearly the ſame meridians, beyond 70.

I will now ſuppoſe the tables turned between the two hemiſpheres of our globe, and that a Southern diſcoverer, meeting with ice upon the banks of Newfoundland, returns to his own hemiſphere fully impreſſed with the impoſſibility of proceeding much to the Northward of N. lat. 46; would not his countrymen be deceived by the inferences which were drawn from what had been obſerved in the ſeas of the Northern hemiſphere?

Bouvet, in 1738, penetrated to 53 S. lat. and in a meridian 5 degrees to the W. of the Cape of Good Hope, in which ſituation he fell in with floating ice; after which he did not proceed any further. Our two ſhips of war, lately ſent upon diſcoveries to the Southward, however, have been ſome minutes within the Antarctic circle, upon a no very diſtant meridian from that in which Bouvet failed.

Muſt the fact be diſbelieved becauſe all the ice in the Polar ſeas comes from the Northward? But this is not ſo, as Mr. Grey informs us[d], that the S. E. wind brings the greateſt quantity of ice to the Coaſts of Spitzbergen; which indeed is highly probable, as this wind

(d) Dr. Birch's Hiſt. R. Soc.

wind blows from thoſe parts of the *Frozen Sea* into which the great rivers of Siberia and Tartary empty themſelves. My own poor conception with regard to the floating ice in the Spitzbergen ſeas is, that theſe maſſes come almoſt entirely from the ſame quarter, as it is ſo difficult to freeze any large quantity of ſalt water. Theſe pieces of ice, therefore, being once launched into the *Frozen Sea*, are diſperſed by winds, tides, and currents, in every direction, ſome of them being perhaps carried to very high Northern latitudes, from which they are again wafted to the Southward.

But allowing, for an inſtant, that all the ice may come from the Northward, muſt not then an open ſea be left in the higher Northern latitudes, from which theſe maſſes of ice are ſuppoſed to have floated?

Was it becauſe the more one advances towards the Pole, vegetation invariably is diminiſhed?—But this is not the fact.

Nova Zembla, ſituated only in N. lat. 76, produces not even any ſorts of graſs *(e)*; ſo that the only quadrupeds which frequent it are foxes and bears, both of which are carnivorous. In the Northern parts of Spitzbergen, on the other hand, they have reyn-deer, which are often exceſſively fat; and Mr. Grey mentions three or four plants, which flower there during the ſummer *(f)*.

Was

(e) Purchas, vol. I. p. 479.

(f) Dr. Birch's Hiſt. R. Soc. vol. I. p. 202. *et ſeq.*.

Was it becauſe no one had ever conceived it poſſible to proceed ſo far as the Pole?

Thorne, however, a merchant of Briſtol, had made ſuch a propoſal in the reign of Henry VIII; and I ſhall now alſo ſhew, that not only Mr. Oldenburgh's contemporaries continued to believe ſuch a voyage to be feaſible, but many great names in ſcience who lived after him.

Wood ſailed on the diſcovery of a N. E. paſſage to Japan in 1676; and, in the publication of his voyage, he hath ſtated the grounds upon which he conceived ſuch a paſſage to be practicable; the ſtrongeſt of all which, perhaps, is the relation of Captain Goulden, with regard to a Dutch ſhip having reached N. lat. 89. Though this account hath often been referred to, I do not recollect to have ſeen it ſtated with all the circumſtances which ſeem to eſtabliſh its veracity beyond contradiction: I ſhall therefore copy the very words of Wood(g).

" Captain Goulden, who had made above thirty " voyages to Greenland, did relate to his majeſty, that " being at Greenland, ſome twenty years before, he " was

(g) Moxon's account of a Dutch ſhip having been two degrees beyond the Pole, was alſo much relied upon by Wood, which hath never been printed at large, but in a now very ſcarce tract of Moxon's, and in the ſecond volume of Harris's Voyages, p. 396. In confirmation of this very circumſtantial and intereſting narrative, I have only to add, that Moxon was hydrographer to Charles II. and hath publiſhed ſeveral ſcientific treatiſes. See the Catalogue of the Bodleian Library.

" was in company with two Hollanders to the eaſtward of " Edge's iſland; and that the whales not appearing on " the ſhore, the two Hollanders were determined to go " further Northward; and in a fortnight's time re- " turned, and gave it out that they had ſailed into the " lat. 89; and that they did not meet with any ice, but " a free and open ſea; and that there run a very hollow " *grown* ſea, like that of the Bay of Biſcay. Mr. " Goulden being not ſatisfied with the bare relation, " they produced him four journals out of the two ſhips, " which teſtified the ſame, and that they all agreed " within four minutes.(b)."

Having thus ſtated Wood's own words, it ſhould ſeem, that they who deny the authenticity of the relation, muſt contend that the crews of both theſe Dutch ſhips entered into a deliberate ſcheme of impoſing upon their brother whale fiſhers, and had drawn up four fictitious journals accordingly, becauſe ſo many are ſtated to have been produced out of the two ſhips to Captain Goulden, whilſt each of them varied a few minutes in the latitude; whereas if they had determined to deceive Captain Goulden and his crew, the journals would probably have tallied exactly. I muſt beg leave alſo to make an additional obſervation on the account as ſtated by Wood, which is, that the Dutch ſhips only went to the Northward, in ſearch of whales, but did not give it out that they intended to make

(b) Wood's Voyage, p. 145. *Grown ſea*, is the expreſſion in the original.

make for the Pole, which if they had done, it might poſſibly have been an inducement to carry on the deception, by a fictitious ſet of journals. To this it may likewiſe be added, that the Dutch are not commonly jokers.

I have already remarked, that Wood makes this account one of the principal reaſons for his undertaking the N. E. paſſage to Japan. Wood therefore (Mr. Oldenburgh's contemporary) was not a diſbeliever, before his voyage, of the poſſibility of reaching ſo high a Northern latitude, nor of any of the circumſtances ſtated in this narrative.

But Captain Wood is not a ſingle inſtance of ſuch credulity, as the very year before he ſailed on his voyage, we find in the Philoſophical Tranſactions for 1675 (i) the following paſſage: "For it is well known "to all that ſail Northward, that moſt of the Northern "coaſts are frozen up many leagues, though in the open "ſea it is not ſo, *no nor under the Pole itſelf*, unleſs by "accident." In which paſſage, the having reached the Pole is alluded to as a known fact, and ſtated as ſuch to the Royal Society.

Wood indeed, after not being able to proceed further than N. lat. 76, diſcredits in the lump all the former inſtances of having reached high Northern latitudes, in the following words:

"So here the opinion of William Barentz was con-"futed, and all the Dutch relations, which certainly "are

(i) N° 118.

" are all forged and abuſive pamphlets, as alſo the rela-
" tions of our countrymen (k)."

In juſtice, however, to the memories of both Engliſh and Dutch navigators, I cannot but take notice of theſe very peremptory and ill-founded reflections, made by Wood; and which ſeem to be dictated merely by his diſappointment in not being able to effect his diſcovery.

Wood attempted to ſail in a N. E. direction between Spitzbergen and Nova Zembla, but was obſtructed by ice, ſo that he could not proceed further than the W. coaſt of Nova Zembla in N. lat. 76. Thinking it, therefore, prudent to return, he at once treats as fabulous, not only the ideas of that moſt perſevering navigator William Barentz, but likewiſe all other accounts of ſhips having reached high Northern latitudes. Now that the ice which obſtructed Wood in N. lat. 76 was not a perpetual, but only occaſional barrier, appears to demonſtration, by the Ruſſians having not only diſcovered, but lived ſeveral years in the iſland of Maloy Brun, which lies between Spitzbergen and Nova Zembla, and extends from N. lat. 77° 25′ to 78° 45′ (l).

(k) Wood's Voyage, p. 181.

(l) See the Engliſh Tranſlation of profeſſor Le Roy's account of this Iſland, p. 85. London, 1774, 8vo, printed for C. Heydinger, in the Strand. See alſo the Sieur de Vaugondy's *Eſſai d'une Carte Polaire Arctique*, publiſhed in 1774, who repreſents this iſland as extending from N. lat. 77° 20′ to 78° 30′, its longitude being 60 degrees E. from Fero.

As for Wood's treating all diſcoveries towards the Pole, from the Northern parts of Spitzbergen, as fabulous, he had not the leaſt foundation, from what he had obſerved on his own voyage, for this unmerited aſperſion upon their veracity; becauſe if Wood's barrier between Spitzbergen and Nova Zembla, in N. lat. 76, had been perpetual, what hath this to do with the courſe of a ſhip ſailing from the Northern parts of Spitzbergen, upon a meridian towards the Pole?

I cannot, however, diſmiſs Wood's voyage, without making ſome further remarks on his concluding, that the obſtructions which he met with in N. lat. 76 were perpetual.

Almoſt every voyage to ſeas, in which floating ice is commonly to be found, proves the great difference between the quantities, as well as ſize of theſe impediments to navigation, though in the ſame latitude and time of the year.

Davis in his two firſt voyages to diſcover the N. W. paſſage, could not penetrate beyond 66; but in his third voyage, in 1587, he reached 72° 12'(m).

In the year 1576, Sir Martin Frobiſher paſſed the Straits (ſince called from their firſt diſcoverer) without any obſtructions from ice: in his two following voyages however, he found them in the ſame month, to uſe his own expreſſion, "in a manner ſhut up with a long "mure of ice (n)." In

(m) See Hakluyt and Purchas, vol. I. p. 84.
(n) Purchas, ibid.

In the year 1614, Baffin penetrated to 81, and thought he ſaw land as far as 82 to the N. E. of Spitzbergen, which is accordingly marked in one of Purchas's maps. During this voyage he met, near Cherry iſland, ſituated only in 74 N. lat. two banks of ice; the one, 40 leagues in length, the other 120; which laſt would extend to 25 degrees of longitude in N. lat. 76, where Wood fixes his barrier.

It need therefore ſcarcely be obſerved, that ſuch a floating wall of ice, 120 leagues long, by being jammed in between land, or other banks of ice, might afford an appearance indeed of forming a perpetual barrier, when perhaps, within the next 24 hours, the wall of ice might entirely vaniſh.

Of the ſudden aſſemblage of ſuch an accumulation of ice, I ſhall now mention two, rather recent inſtances.

I have been very accurately informed, that the late Colonel Murray happened to go, in the month of May, from one of our Southern colonies to Louiſburgh, when the harbour was entirely open; but on riſing in the morning, it was completely filled with ice, ſo that a waggon might have paſſed over it in any direction.

I have alſo received the following account from an officer in the royal navy, who was not many years ago on the Newfoundland ſtation.

In the middle of June, the whole ſtraits of Belliſle were cloſed, in the ſame manner with the harbour of Louiſburgh, and for three weeks together, a carriage might have paſſed from one ſhore to the other; when

upon riſing in the morning, the ice had almoſt entirely diſappeared. Such is the ſudden accumulation and removal of ice, in latitudes 24 and 30 degrees to the Southward of Wood's ſituation.

I ſhall now endeavour to ſhew, that Dr. Halley was no more incredulous with regard to the poſſibility of reaching high Northern latitudes, than Captain Wood was, before the ill ſucceſs of his voyage on diſcovery.

Mr. Miller, in his Gardener's Dictionary, hath the following paſſage, under the article, THERMOMETER:

" Mr. Patrick has fixed his thermometer to a ſcale of " ninety degrees, which are numbered from the top " downwards, and alſo a moveable index fixed to it. " The deſign of this is to ſhew, how the heat and cold " is changed from the time it was laſt looked upon, " according to the different degrees of heat and cold in " all latitudes. As by the trial of two thermometers, " which have *been regulated abroad*; the one by Dr. " Halley, in his late Southern voyage; and the *other by* " *Captain* Johnſon, *in his voyage to Greenland*; the firſt " hath a heat under the equinoctial line, and the other " *a degree of cold in* 88 *degrees of N. latitude*."

I have taken ſome pains to find out a more full account of this voyage of Captain Johnſon's; but have only met with the following confirmation of it perhaps, in the 1ſt vol. of Monſ. de Buffon's Natural Hiſtory (o).

" I have

(o) Vol. I. p. 215, quarto.

" I have been aſſured, *by perſons of credit*, that an " Engliſh captain, whoſe name was Monſon, inſtead of " ſeeking a paſſage to China between the Northern " countries, had directed his courſe to the Pole, and " had approached it within two degrees, where there " was an open ſea, without any ice."

As the Captain *Monſon* mentioned in this paſſage, reached exactly the ſame degree of latitude with Captain *Johnſon*, I ſhould rather think, that this is the ſame voyage; eſpecially, as it is well known, that the French writers ſeldom trouble themſelves about the orthography of foreign names.

If this, however, ſhould not be the caſe, it muſt be admitted to be an additional inſtance of a ſhip's having reached N. lat. 88, as well as Monſ. de Buffon's giving credit to ſuch relation (p).

Having therefore not been able to pick up any other circumſtances in relation to Captain Johnſon's voyage, I ſhall now ſtate what ſeems to be fairly deducible from the paſſage which I have copied from Miller's Gardener's Dictionary.

Dr. Halley made his voyage to the Southward in 1700; on the return from which, he probably employed

(p) To this liſt of credulous perſons (as perhaps they may be conſidered by ſome) I ſhall beg leave to add the names of Maclawrin and Dr. Campbell. The former of theſe was ſo perſuaded of the ſeas being open quite to the Pole, that he hath not only adviſed this method of proſecuting diſcoveries; but as I have been informed, was deſirous of going the voyage himſelf.

ployed Patrick, as the moſt eminent maker of weather glaſſes(q), to graduate a thermometer, according to the heat he had experienced under the equator. It was very natural therefore, when ſuch a point of heat was to be marked upon the inſtrument, to graduate it either for high Southern, or Northern latitudes.

It ſhould ſeem then, that Dr. Halley had procured Captain Johnſon (who was maſter of a Greenland ſhip) to carry a thermometer on his voyage to Spitzbergen, and that he fortunately was able to reach ſo high a degree of latitude as 88.

If the thermometer had been calculated only for imaginary degrees of heat and cold, it would have been marked for the Equator and the Pole; whereas it was only graduated for 88 degrees of N. latitude, which Captain Johnſon therefore had as clearly reached, as Dr. Halley had the Equator.

At all events, Patrick's thermometer muſt have been made under Dr. Halley's inſpection; and would he have permitted it to be marked for 88 degrees of N. latitude, according to Captain Johnſon's voyage, if he had diſbelieved his narrative?

My third and laſt inſtance, from any printed authority, but in a book which is not commonly to be met with, is, that of Captain Alexander Cluny, as by a map, engraved under his direction, the very ſpot is marked

(q) I have been informed, that his ſhop was in the Old Bailey, and that he died about fifty years ago.

marked to the Weſtward of Spitzbergen, and in ſomewhat more than 82 degrees of N. latitude, where he ſaw neither land nor ice (r).

Before I proceed, however, to ſtate ſeveral other inſtances of reaching high Northern latitudes, which have never appeared in print, and which I have collected ſince my laſt paper on this head, I muſt beg the indulgence of the Society, whilſt I lay before them ſome additional reaſons why the Polar ſeas may be conceived to be navigable (s).

Speculative geographers have ſuppoſed, that there ſhould be nearly the ſame quantity of land and ſea in both hemiſpheres, in order to preſerve the equilibrium of the globe.

It

(r) See the American Traveller, London, 1769, quarto; as alſo, the Sieur de Vaugondy's *Eſſai d'une Carte Polaire Arctique*, publiſhed in 1774; where however, he lays down this ſpot from Cluny's map in little more than 81, whereas it is fully in 82. The longitude of this ſpot is 30 degrees E. from Fero.

(s) I have lately received a letter from the Rev. Mr. Tooke, Chaplain to the Factory at St. Peterſburgh, dated December 30, 1774, which he concludes in the following manner: "I have a fact or two to communicate, which ſeem "to indicate, if not to a certainty, yet at leaſt to a great degree of probability, "that the ſea is open to the Pole the year throughout; but my paper will not "hold them." From the accuracy with which ſeveral other intereſting particulars are ſtated in this letter, I have great reaſon to regret, that I have not an opportunity of laying the facts alluded to before the Public, with all their circumſtances, as I have reaſon to ſuppoſe, that Mr. Tooke's information came from Archangel ſeamen.

It is poſſible indeed, that this may be accounted for by the Antarctic ſeas being more ſhallow than thoſe near the North Pole; as we do not know this, however, by the actual ſoundings, but are informed by Captain Fourneaux, that there is no land even as far as the Antarctic circle, upon the meridian in which he ſailed; as alſo, that no land was obſerved during the courſe of his circumnavigation in 55 S. lat. at a medium, it ſeems neceſſary, as the quantity of land ſo greatly preponderates in the Northern hemiſphere, that from N. lat. $80\frac{1}{2}$ to the Pole itſelf, muſt be chiefly, if not entirely ſea.

Let us now conſider, whether ſuch a ſea is probably at all times in a ſtate of congelation.

I do not know, whether it hath been ſettled by thermometrical obſervations, that there is any material difference between the heat under the Equator, and that which is experienced within the Tropics; moſt travellers complain indefinitely of its exceſs in ſuch latitudes.

As this point, therefore, ſeems not to have been ſettled by the thermometer, let us have recourſe to what is found to be the freezing point upon mountains, ſituated almoſt under the Equator, and compare it with the ſame height on the Pic of Teneriff, which being in N. lat. 28, is five degrees to the Northward of the tropical limits.

The French Academicians ſuppoſe, that the freezing point, at which all vegetation ceaſes, and ice takes

place, commences on Cotopaxi, at 1411 toiſes above the level of the ſea; or, by our meaſure, at the height of about a mile and three quarters (t).

Mr. Edens, on the other hand, hath given us a very particular account of what he obſerved in going to the top of Teneriff (u); and ſo far from ſeeing ſnow or ice (except in a cave) his coat was covered, during the night, with dew, at the very ſummit, which, according to Dr. Heberden's computation, is 15,396 feet high, or wants but 148 yards of three miles (x).

Now as it is thus ſettled, that the Pic of Teneriff is nearly three miles high, which exceeds by more than a mile the height of the freezing point on Cotopaxi, ſituated under the Equator, it ſhould ſeem that there is no material difference between the heat under the Equator and within the Tropics; for if it is urged, that Teneriff is more ſurrounded with ſea than Cotopaxi, it muſt on the other hand be recollected, that this mountain is ſituated 5 degrees to the Northward of the Tropic, at the ſame time that the ſummit exceeds the freezing

(t) Cotopaxi is the higheſt mountain of the Andes, at leaſt in the neighbourhood of Quito. The plain of Carabuca, from which it riſes, is 1023 toiſes above the level of the ſea, and the height of the mountain above this plain is 1268 toiſes, making together 2291 toiſes. If 880 toiſes therefore are deducted from 2291, 1411 toiſes become the height of the freezing point upon this mountain. See Ulloa's Account of S. America.

(u) Phil. Tranſ. Abr. vol. V. p. 147. Sprat's Hiſt. R. Soc.

(x) See Hawkeſworth's Voyages, vol. II. p. 12. Goats alſo reach the very ſummit, which muſt be in ſearch of food, as they do not bear cold well.

point on Cotopaxi by more than a mile; both which circumſtances ſhould render it colder than the freezing point on Cotopaxi.

The inference to be drawn from this compariſon ſeems to be, that as the heat varies ſo little between the Equator and the tropical limits, it may differ as little between the Arctic circle and the Pole.

Nothing hath been ſuppoſed to ſhew more ſtrongly the wiſdom of a beneficent Creator, than that every part of this globe ſhould (taking the year throughout) have an equal proportion of the Sun's light.

It is admitted, that the equatorial parts have rather too much heat for the comforts of the inhabitants, and thoſe within the Polar circles too little; but as we know that the tropical limits are peopled, it ſhould ſeem, that the two Polar circles are equally deſtined for the ſame purpoſe; or if not for the benefit of man, at leaſt for the ſuſtenance of certain animals.

The largeſt of theſe, in the whole ſcale of Creation, is the whale; which, though a fiſh, cannot live long under water, without occaſionally raiſing its head into another element, for the purpoſe of reſpiration: moſt other fiſh alſo occaſionally approach the ſurface of the water.

If the ice therefore extends from N. lat. 80½ to the Pole, all the intermediate ſpace is denied to the Spitzbergen whales, as well perhaps as to other fiſh; and is that glorious luminary, the Sun, to ſhine in vain for half the year upon ten degrees of latitude round each of the

Poles, without contributing either to animal life or vegetation? for neither can take place upon this dreary expanſe of ice.

If this tract of ſea alſo is thus rendered improper for the ſupport of whales, theſe enormous fiſh, which require ſo much room, will be confined to two or three degrees of latitude in the neighbourhood of Spitzbergen; for all the Greenland maſters agree, that the beſt fiſhing ſtations are from 79 to 80, and that they do not often catch them to the Southward.

I will now aſk, if the ſea is congealed from N. lat. 80½ quite to the Pole, when did it thus begin to freeze, as it is well known, that a large quantity of ſea water is not eaſily forced to aſſume the form of ice (y)? Can it be con-

(y) "There are three kinds of ice in the Northern ſeas. The firſt is like "melted ſnow which is partly hardened, is more eaſily broken into pieces, leſs "tranſparent, is ſeldom more than ſix inches thick, and when melted, ſalt is "found in it. This firſt ſort of ice is the only one which is ever formed from "ſea water.

"If a certain quantity of water, which contains as much ſalt as ſea water, "is expoſed to the greateſt degree of cold, it never becomes firm and pure ice, "but reſembles tallow, or ſuet, whilſt it preſerves the taſte of ſalt, ſo that the *ſweet* "tranſparent ice can never be formed in the ſea. If the ice of the ſea itſelf, "therefore, confined in a ſmall veſſel without any motion, cannot thus become "true ice, much leſs can it do ſo, in a deep and agitated ocean." The author hence infers, "that all the floating ice in the Polar ſeas comes from the "Tartarian rivers and Groenland," as I have before contended. See a Diſſertation of Michel Lomonoſof, tranſlated from the Swediſh Tranſactions of 1752. *Collection Académique*, Tom. XI. p. 5. *& ſeq.* Paris, 1772, quarto. The Diſſertation is entitled, "*De l'Origine des Monts de Glace, dans la Mer du "Nord.*"

contended, that ten degrees of the globe round each pole, were filled with an incruſted ſea at the original creation? And if this is not inſiſted upon, can it be ſuppoſed, that when the ſurface of the Polar ocean firſt ceaſed to be liquid, it could have reſiſted the effects of winds, currents, and tides?

I beg leave alſo, to rely much upon the neceſſity of the ice's yielding to the conſtant reciprocation of the latter; becauſe no ſea was ever known to be frozen but the Black Sea, and ſome ſmall parts of the Baltic(*), neither of which have any tides(a), at the ſame time that the waters of both are known to contain much leſs ſalt than thoſe of other ſeas, from the great influx of many freſh water rivers. For this laſt reaſon, it may likewiſe be preſumed, that the circumpolar ſeas are very ſalt, becauſe there is probably no ſuch influx beyond N. lat. 80, Spitzbergen itſelf having no rivers.

Having thus given ſome general reaſons, why the ſea ſhould not be ſuppoſed to be frozen in the ten higheſt degrees of latitude, I ſhall now proceed to lay before the Society, ſeveral inſtances, which I have lately collected, and which prove that it is not ſo covered with ice conſiderably to the N. of $80\frac{1}{2}$.

I ſhall

(*) To theſe perhaps may be added the White Sea.

(a) The tides indeed do not riſe to a great height on the Northern coaſt of Spitzbergen; but I do not know that it muſt follow from thence, that they may not be more conſiderable, as the Pole is approached; at leaſt ſuch an inference is by no means concluſive.

I ſhall, however, previouſly make two obſervations; the firſt of which is, that every inſtance of exceeding N. lat. $80\frac{1}{2}$, as much proves that there is no perpetual barrier of ice in that latitude, as if the navigator hath reached the Pole. The ſecond is, that as four experienced Greenland maſters have concurred in informing me, that they can ſee what is called the *blink of the ice*(b), for a degree before them, they never can be off Hakluyt's Headland, which is ſituated in 79° 50′, without obſerving this effect of the ice upon the ſky, if there was a perpetual barrier at $80\frac{1}{2}$, which is not much more than half a degree from them, when in that ſituation. Now Hakluyt's Headland is what they ſo perpetually take their departures from, that it hath obtained the name of *The Headland* by way of preeminence.

This mountain alſo is ſo high, that it can be diſtinguiſhed at the diſtance of a degree: in ſuch inſtances, therefore, which I ſhall produce, that do not ſettle the latitude by obſervation, whenever the reckoning depends upon the approach or departure from this Headland, the account receives the additional check of the mountain's being increaſed or diminiſhed gradually to the eye of the obſerver.

My ſecond previous remark ſhall be, that in all inſtances of reaching high Northern latitudes, for which the authority of the ſhip's journal may be required,

(b) This is deſcribed to be an arch formed upon the clouds, by reflection from the *packed ice*.

quired, it is almoſt impoſſible to procure this ſort of evidence, except the voyages have been recent; not only for the reaſons I have given in my former paper, but becauſe I find, that if the ſhip's journal is not wanted by the owners in a year or two (which ſeldom happens) it is afterwards conſidered as waſte paper.

Without the leaſt impeachment alſo of the knowledge in navigation of the Greenland maſters, when they are in the actual purſuit of fiſh, they do not trouble themſelves about their longitude or latitude; they are not bound by their inſtructions to ſail to any particular point, and their only object is to catch as many whales as poſſible; the ſhip's ſituation therefore, at ſuch time, becomes a matter of perfect indifference. It will appear, however, that they not only keep their reckonings, but obſerve, when they are not thus employed in fiſhing.

Having made theſe previous remarks, I ſhall now proceed to lay before the Society, ſuch inſtances of navigators having penetrated beyond $80\frac{1}{2}$, as I have happened to procure ſince the reading of my former paper on this ſubject, in May laſt.

James Hutton (then belonging to the ſhip London, Captain Guy) was, thirty years ago, in N. lat. $81\frac{1}{2}$, as both the captain and mate informed him; but did not obſerve himſelf. A very intelligent ſea officer was ſo good as to take from him this account, together with the following particulars, which perhaps may be intereſting to Greenland navigators.

Hutton

Hutton hath been employed in the whale fiſhery nearly theſe forty years, during which he hath been ſeveral times at the Seven Iſlands, and the Waygat Straits. In ſome of theſe voyages the ſea hath been perfectly clear from ice, and at other times it hath ſet in ſo rapidly towards the Waygat, as to oblige the veſſels which happened to be thereabouts, to force all ſail poſſible, to eſcape being incloſed.

This hardy old tar likewiſe ſuppoſes, that he hath been further up the Waygat than perhaps any perſon now living; for he was once in a ſhip which attempted to paſs through it, nor did the maſter deſiſt, till they ſhoaled the water to three fathoms, when the ſea was ſo clear, that they could diſtinguiſh the bottom from the deck.

Mr. John Phillips, now maſter of the Exeter, but then mate of the Loyal Club, in the year 1752, reached N. lat. 81 and ſeveral minutes by obſervation, which circumſtance was confirmed by another perſon on board the Exeter laſt ſummer, on her return from the Greenland fiſhery. Captain Phillips added, that it was *very common* to fiſh in ſuch latitudes.

Mr. George Ware, now living at Erith in Kent, ſerved as chief mate in the year 1754, on board the Sea Nymph, Captain James Wilſon, when, at the latter end of June, they ſailed through floating ice from 74 to 81; but having then proceeded beyond the ice, they purſued the whales to 82° 15′, which latitude was determined by Mr. Ware's own obſervation.

As the ſea was now perfectly clear, as far as he could diſtinguiſh with his beſt glaſſes, both Mr. Ware and Captain Wilſon had a ſtrong inclination to puſh further towards the Pole; but the common ſailors hearing of ſuch their intention, remonſtrated, that if they ſhould be able to proceed ſo far, the ſhip would fall into pieces, as the Pole would draw all the iron work out of her.

On this Captain Wilſon and Mr. Ware deſiſted, as the crew had theſe very ſingular apprehenſions; eſpecially as they had no whales in ſight to the Northward, which alone would juſtify the attempt to their owners(c). It need ſcarcely be obſerved, however, that the notion which prevailed amongſt the crew ſhews, that the common ſeamen on board the Greenland ſhips conceive, that the ſea is open to the Pole; they would otherwiſe have objected on account of the ice being ſuppoſed to increaſe. It ſhould ſeem alſo, that the practicability of reaching the Pole is a point which they often diſcuſs amongſt themſelves.

In *this ſame year and month*, Mr. John Adams (who now is maſter of a flouriſhing academy at Waltham Abbey, in Eſſex) was on board the Unicorn, Captain Guy, when they anchored in Magdalena Bay(d), on the Weſtern coaſt of Spitzbergen and N. lat. 79° 35′. They

(c) This circumſtance of not ſeeing any whales to the Northward, accounts for Captain Guy's deſiſting, in the following inſtance, from ſailing to the Northward, as alſo in many others which I ſhall have occaſion to ſtate.

(d) The Greenland maſters moſt commonly call this bay Mac-Helena.

They continued in this bay for three or four days, and then ſtood to the Southward, when the wind freſhning from that quarter, but the weather foggy, they proceeded with an eaſy ſail for four days, expecting to meet with fields of ice, to which they might make faſt; but they did not encounter ſo much as a piece of floating ice. On the fifth day the wind veered to the Weſtward, the weather cleared up, and Mr. Adams had a good obſervation (the Sun above the Pole(*)) by which he found himſelf three degrees to the Northward of Hakluyt's Headland, or in N. lat. 83.

Captain Guy now declared, that he had never been ſo far to the Northward before, and crawled up to the main-top maſt head, accompanied by the chief mate, whilſt the ſecond mate together with Mr. Adams went to the fore-top maſt head, from whence they ſaw a ſea as free from ice as any part of the Atlantic ocean, and it was the joint opinion of them all, that they might have reached the N. Pole.

The ſhip then ſtood to the Southward, and twelve hours afterwards Mr. Adams had a ſecond good obſervation (the Sun beneath the Pole) when their latitude was 82° 3′. In both theſe obſervations, Mr. Adams made an allowance of 5′ for the refraction, which, he ſays, was his captain's rule, who was now on his 59th or 60th voyage to the Greenland ſeas.

(*) The old navigators to theſe parts call this a *South Sun.*

In the year 1756, Mr. James Montgomery, now a merchant in Preſcot-ſtreet, Goodman's-fields, but then maſter of the Providence, followed the whales during the month of June till he reached N. lat. 83, by obſervation. Another Greenland maſter informs me, that he remembers well the ice packed much to the Weſtward, but that the ſea was open to the Northward during that ſummer.

In 1762, David Boyd, then mate of the brig Betſy, was driven by a gale of wind from 79 to 82, odd minutes, by obſervation; during all which time he was beſet in ice. A Greenland maſter has likewiſe told me, that he recollects many other ſhips were driven to the N. E. from their fiſhing ſtations during that ſeaſon.

Mr. Jonathan Wheatley, now maſter of a Greenland ſhip, was in 1766 off Hakluyt's Headland(f), whence, not meeting with ſucceſs, he ſailed N. W. to 81½, in which latitude he could ſee no ice in any direction whatſoever from the maſt head, though there was a very heavy ſea from the N. E.

Mr. Wheatley alſo informs me, that whilſt he was off the Coaſt of Greenland, three Dutch Captains told him, that a ſhip of their nation had been in 89, and they all ſuppoſed, that the ſea in ſuch a latitude might be as free from ice as where they were fiſhing. This account probably alludes to the Dutch man of war on board of which Dr. Daillie happened to be, the circumſtances

(f) He was then on board a ſhip called the Grampus.

cumſtances of which voyage I have ſtated in my former paper,

This ſame captain is ſo thoroughly perſuaded of being able to approach the Pole, that he will attempt it whenever an opportunity offers of doing it, without prejudice to his owners. On ſuch a voyage of diſcovery, he would not wiſh a larger veſſel than one of 90 tons, nor more than ten hands. I find, indeed, that this is the ſize of the ſhip, in which moſt of the early navigators attempted to penetrate far to the Northward.

In 1769, Mr. John Thew, now maſter of a Greenland ſhip called the Riſing Sun, was in N. lat. 82, and 100 leagues to the W. of Hakluyt's Headland. The circumſtances by which he ſuppoſed himſelf to have been in this ſituation, were ſtated to me in the preſence of a very able ſea officer, who told me afterwards, that he was perfectly ſatisfied with the accuracy of his account.

Captain John Clarke, of the Sea Horſe, at the latter end of June 1773, ſailed from the Headland N. N. E. to 81½, which he computed by his run from the Headland in 18 hours, having loſt ſight of it. At this time there was an open ſea to the Northward, and ſuch a ſwell from the N. E. that the ſhip would not ſtay, being under her double reef'd topſails, whilſt the wind blew freſh.

During this run from the Headland, Mr. Clarke fell in with Captain Robinſon in 81° 20′, whom I mentioned in my former paper as having reached 81½ in the ſame month and year, by a very accurate obſervation.

This

This ſame Captain Robinſon, on the 28th of June laſt, paſſed by Hakluyt's Headland, lying off and on for ſeveral days, during which he was ſometimes a degree to the Northward of it, and till the 20th of July following, there was no obſtruction to his proceeding Northward; to which, however, he had no inducement, as he caught two large whales in this latitude.

Captain John Reed, of the Rockingham, alſo in July laſt, purſued ſome whales 15 leagues to the Northward of the Headland, and confirms Captain Robinſon's laſt account, by ſaying, he could then ſee no ice from his maſt head.

Captain Reed was brought up in the Greenland fiſhery, and remembers well, that whilſt on board his father's ſhip, the Thiſtle, the mate told him, that they had reached 81° 42′, when there was indeed a good deal of ice, but full room to ſail in any direction.

Mr. Reed likewiſe hath informed me, that about 15 years ago, a Dutch Captain (whoſe name was Hans Derrick) told him, whilſt they were together in the Greenland ſeas, that he had been in N. lat. 86, when there were only ſome ſmall pieces of floating ice to be ſeen. Hans Derrick moreover added, that there were then five other ſhips in company, which took one with another eighteen ſmall whales.

Mr. Reed ſuppoſes, that this Dutch maſter may be ſtill living, and I ſhall, therefore, endeavour to procure further intelligence about this Greenland voyage from

Holland; at all events, the account is ſo circumſtantial, that it ſeems well to deſerve attention.

I have great reaſon to expect ſeveral other inſtances of the ſame kind, in a ſhort time, from the different ports of this kingdom where there is any conſiderable Greenland trade: I ſhall not, however, trouble the Society with them, till I know whether they would wiſh any further information on this head.

I ſhall now recapitulate the different latitudes which have been reached by the ſeveral navigators whoſe names I have mentioned in this and my former paper. I ſhall alſo take credit for nearly a degree to the Northward of their ſeveral ſituations, becauſe the *blink or glare* of the *packed ice* is to be diſtinguiſhed at this diſtance, when the weather is tolerably fair.

80°. 45′. Captain John Reed.
81°. For three weeks together, Captain Thomas Robinſon.
81°. odd minutes. Captain John Phillips.
81°. 30′. Four inſtances; *viz.* James Hutton, Jonathan Wheatley, Thomas Robinſon, John Clark.
82°. Two inſtances; *viz.* Captains Cheyne and Thew.
82°. odd minutes. Two inſtances; *viz.* Cluny and David Boyd.
82°. 15′. Mr. George Ware.
83°. Two inſtances; Mr. John Adams and Mr. James Montgomery.
83°. 30′. Mr. James Watt, lieutenant in the royal navy.

86°. Five

86°. Five ſhips in company with Hans Derrick.

88°. Two inſtances; Captain Johnſon and Dr. Daillie; to which, perhaps, may be added Captain Monſon as a third.

89°. Relation of the two Dutch ſhips to Captain Goulden(g).

89°. 30′. Dutch relation to Mr. Grey.

DAINES BARRINGTON, F.R.S.

(g) This inſtance, however, hath before been relied upon, though never, perhaps, circumſtantially ſtated, but by Captain Wood.

POST-

POSTSCRIPT.

January 8, 1775.

HAVING procured the three following inſtances before the reading of my paper was finiſhed, it may not be improper to add them in a poſtſcript.

In Harris's Voyages [b] is the following paſſage, "By "the Dutch Journals they get into N. lat. 88° 56', "and the ſea open."

I have within theſe few days, aſked Dr. Campbell, the very able compiler of theſe voyages, upon what authority he inſerted this account? Who informs me, that he received it from Holland about 30 years ago, as being an extract from the journals produced to the States General in 1665, on the application for a diſcovery of the N. E. paſſage to Japan, which was fruſtrated by the Dutch Eaſt India Company.

In the *Journal des Sçavans*, for the month of October 1774 [i], is likewiſe the following paragraph:

"To theſe inſtances produced by Mr. Barrington" [of navigators having reached high Northern latitudes], "our countrymen (*viz.* the Dutch) could add many "others. An able officer in the Engliſh ſervice, hath in "his cuſtody, the journals of a Greenland ſhip, wherein "he

(*b*) Vol. II. p. 453.
(*i*) Part. II. p. 503.

" he hath remarked, that in the month of May he had " penetrated as far as 82° 20′, when the ſea was open."

The ſame journaliſt confirms what I have before mentioned, that Monſ. de Bougainville will try to reach the Pole(k).

My third and laſt inſtance is that of Captain Bateſon, who ſailed in 1773, from Liverpool, in a ſhip called the Whale, on the Greenland fiſhery, and who, on June 14, reached N. lat. 82° 15′, computed by his run-back to Hakluyt's Headland(l). As this happened ſo recently, Captain Bateſon (as well as many of the other maſters, whoſe accounts I have before mentioned) hath his journal to produce, if it ſhould be required.

This ſeems to be the ſtrongeſt confirmation of both Captain Robinſon and Captain Clark's having been, during this ſame year and month, in 81½; as alſo of their having met each other in 81° 20′, according to what I have already ſtated.

I muſt not loſe this ſame opportunity of laying before the Society, the information which I have juſt now received from M. de Buffon, in relation to what I have cited from his Natural Hiſtory of Captain Monſon's having reached N. lat. 88°, " *as he was told by perſons of* " *credit*."

Upon

(k) Ibid. p. 506.

(l) His inducement to proceed ſo far North, was the purſuit of whales. I have ſhewn the extracts from Captain Bateſon's journal to a very able ſea officer, who is perfectly ſatisfied with the accuracy of it.

Upon my taking the liberty to inquire, *who thoſe perſons of credit were?* Monſ. de Buffon refers me to Dr. Nathan Hickman, who in 1730 travelled as one of Dr. Ratcliff's fellows[m]; and who ſuppoſed, that Captain Monſon's journal might have been at that time procured in England. Monſ. de Buffon alſo recollects, that a Dutchman was then preſent, and confirmed the account.

(m) He was alſo a fellow of the Royal Society in 1730.

ADDITIONAL PAPERS

FROM

H U L L.

WHILST I was waiting in expectation of ſeveral additional inſtances of Dutch ſhips, which had been in high Northern latitudes, I received the following anſwers to certain queries, relative to the Greenland ſeas, from a very eminent merchant of Hull, and which he is ſo obliging as to permit me to lay before the public. March 31, 1775. *D. B.*

I. From Captain JOHN HALL of the *King of Pruſſia.*

Anſwer to 1ſt Query, *viz.* How near hath any ſhip approached the Pole?

I have known ſhips go into the latitude of 84° North, and did not hear of any difficulty they met with; but it is not often that the ice will permit them to go ſo far North.

N. B. On enquiring of Captain Hall what ſhips he had known penetrate ſo far? He replied, they were ſome Dutch ſhips he heard had done ſo, but knew no particulars.

2d Query. When are the Polar ſeas moſt free from ice? The

The ſeas are moſt incumbered with ice from about the 1ſt of September to the 1ſt of June following; and in conſequence, between the 1ſt of June and September, the ice lyeth furtheſt from Spitzbergen. And I know no other precaution to be taken reſpecting the Pole, than that they muſt watch the opportunity when the ice lyeth furtheſt from the land.

3d Query. How far to the Southward have you firſt ſeen ice?

In the ſpace of twenty years I have twice known, that we met with the ice in the latitude of 74° 30′ North, and could not find a paſſage to the Northward till the month of July, and then got into the latitude of 78° with much difficulty, in running through the openings of great bodies of ice; and ſome years we find a paſſage to the latitudes 79 and 80° North, without much difficulty from the ice. Some years I have known ſhips go round the North part of Spitzbergen, between thence and the North-eaſt, and ſo come out between Nova Zembla and the South part of Spitzbergen; but this paſſage is ſeldom to be found free from ice.

4th Query. From what quarter is the wind coldeſt whilſt off Spitzbergen?

Northerly and E.N.E. winds are moſt froſty; but ſnow and froſt we have very common with all winds, except part of June, July, and Auguſt. If the winds be Southerly the weather is milder, but ſubject to ſnow, ſleet, and thick weather. The winds, currents, and the ice being ſo variable, I cannot form any judgement of the time when they may be expected. The

The opinion of the old ſeamen is, that we may proceed further North than ever has been yet attempted; but this muſt be done with caution. An opportunity is to be watched for in thoſe ſeas. The moſt likely time for ſuch diſcoveries to be made, is in the months of July and Auguſt, when the ice is moſt commonly furtheſt from the land; but ſome years not to be found open at all from the land. And when it is open, they muſt obſerve the ice muſt lay a long way from the North part of Spitzbergen; for I have known ſhips that made attempts to go to the Northward, and before they returned back, the ice ſet in with the land, ſo that they have been obliged to leave the ſhips to the Eaſt of Spitzbergen.

N. B. The ice always ſets in with the land the back of the year.

II. From Captain Humphry Ford of the *Mancheſter*.

1ſt. I was once as high as the latitude 81° 30′ North, in the ſhip Dolphin of Newcaſtle, in the year 1759 or 60, and have been ſeveral times ſince as high as the latitude 81°, in the ſhips Annabella and Mancheſter, in which latitude I never met with any uncommon circumſtances, but ſuch as I have met with in the latitudes 75, 76, 77, 78, and 79°; if to the weſtward, I was commonly incumbered with large quantities of ice.

2d. I

2d. I ſuppoſe that the Greenland ſeas are moſt incumbered with ice in the months of December, January, February, and March; for in the latter part of April and the firſt of May the ice generally begins to ſeparate and open; and in the months of June and July, we generally find the Greenland ſeas moſt clear of ice.

3d. The only precaution to be taken, in order to proceed towards the Pole, is to fit out two ſtrong ſhips that are handy and ſail faſt, well equipped, and ſecured in the manner of thoſe that are generally ſent to Greenland on the whale fiſhery. Such ſhips ſhould be manned with about forty able ſeamen in each, and victualled for eighteen months or two years, and be entirely under the command of ſome expert, able, and experienced ſeaman, who has frequented thoſe ſeas for ſome time paſt. They ſhould ſail from England about the middle of April, in order to be in with the edge of the ice about the 10th of May, when it begins to ſeparate and open.

4th. There is not the leaſt reaſon to ſuppoſe, that the ſeas to the Weſt, North-weſt, and North of Spitzbergen are covered with permanent and perpetual ice, ſo as never to be opened by the operation of the winds; for daily experience ſhews us, that a Northerly wind, when of any long duration, opens and ſeparates the ice, ſo as to admit of ſhips going amongſt it in ſundry places to a very high latitude, if attempted.

N. B. I never was to the Eaſtward of Spitzbergen; but am of opinion, that the ice is much the ſame there

there as to the North and North-weſt of Spitzbergen.

I generally find that Northerly winds bring froſt and ſnow; on the contrary, Southerly winds bring mild weather and rain; but none of thoſe winds appear to be periodical, except cloſe in with the land, called Fair Foreland, where I generally find the winds in the months of June and July to blow moſtly from the S.S.W. and very often exceſſive ſtrong.

It is my opinion, by obſerving the above, that in ſome years ſhips might penetrate very nigh the Pole; if not, the impracticability muſt ariſe from the large quantity of ice that lies in thoſe ſeas.

III. From Captain Ralph Dale of the *Ann and Elizabeth.*

I am willing to give you my opinion, in regard to the queries received of you, ſo far as my obſervations will juſtify.

1ſt. In the year 1773, I ſailed North 81°, when I was much incommoded with large fields of ice, but the air was not ſenſibly different there from what I found it a few more degrees Southerly.

2d. I have for many years uſed the Greenland fiſhery; and have, by experience, found thoſe ſeas the leaſt encumbered with ice betwixt the forepart of May till July.

3d. The

3d. The ſame year I ſailed to the latitude abovementioned, I found in May month, to the Weſt of Spitzbergen, a fine open ſea, the wind then blowing South-weſt, and the ſea (as far as I could obſerve from the maſt-head) was little incumbered with ice, which fully convinced me, that there was a probability of penetrating to a very high latitude.

4th. I have obſerved, that let the wind blow from what quarter it will, it is at times impregnated with froſt, ſnow, &c.; but when moſt ſo I am not able to determine. As for rain, I do not recollect ever ſeeing any there. The weather I have generally found mildeſt when the wind blows Southerly. As for periodical winds, I do not ſuppoſe there are any in Greenland.

IV. From Captain John Greenshaw.

In regard to the Queries ſent to me, all I have to ſay is, that if a paſſage to the North Pole is ever to be accompliſhed, my opinion is, it muſt be obtained by going betwixt Greenland and Nova Zembla, as I myſelf have been to the Weſtward of Greenland, and penetrated ſo far to the Northward as 82° of North latitude, and to the North and North-weſt of that found nothing but a ſolid body of ice: my opinion, therefore, is, that it is impoſſible ever to obtain a paſſage that way. Captain John Cracoft, in the South Sea Company's time, was once ſo far as 83° North latitude, and to the Northward of Greenland, and met with nothing but a

ſolid field of ice. And in regard to the winds and weather, it freezes continually; but the wind from the Southward doth commonly bring rain and thick foggy weather, which is chiefly in the latter end of June and July. If you are to the Northward and Weſtward of Greenland, the wind from the N. W. and N. N. W. doth always open the ice; but at the ſame time, if it come to blow any time from that quarter, packs it cloſe in with the land; and the winds from the Southward have the contrary effect.

V.

The Queries anſwered by ANDREW FISHER, maſter of a Greenland ſhip at Hull, who has been twenty-four voyages from England to the Greenland ſeas.

1ſt. Said Andrew Fiſher ſays, that in the year 1746, being on board the ſhip Ann and Elizabeth from London, on a voyage to the Greenland ſeas, he ſteered from Hakluyt's Headland in Spitzbergen North and N. N. W. in clear water till they were in latitude 82° 34′, where they met with a looſe pack of ice, and made their fiſhery, or otherwiſe they might have got through that looſe ice, and doubt not, but that they might have gone conſiderably further North; they returned, however, in clear water to Spitzbergen.

2d. Beſt ſeaſons of the year are, to be at or near Spitzbergen from the 15th of May to the 1ſt of June, though the years differ, and the laying of the ice exceedingly; ſome years it is not poſſible to get North of 80°,

80°; at other times you may meet with very little ice, which is chiefly owing to the weather in winter, and the winds in April and May.

3d. There is not any reaſon to ſuppoſe, that there is any permanent ice, either North or Weſt of Spitzbergen, ſo far as 90°; and it hath been always found, by able and experienced navigators, that there is not near the quantity of ice, nor ſo liable to ſet faſt to the North of Spitzbergen as there is to the South of 80° as far as 74°, owing to the continent of America (called Gallampus land by the ſailors and Spitzbergen), which makes a narrow paſſage in proportion to what it is to the North of Spitzbergen. The land of America is ſometimes ſeen by our Greenland traders from latitude 74° to 76°, and as it is not ſeen any further North, is ſuppoſed to round away to the North-weſt, which makes it imagined by many, that there is not any land near the Pole.

4. South winds bring moſt ſnow; North winds bring froſt; but that is in the month of April and two-thirds of May; after that time, to the 1ſt or 10th of July, it is in general mild, fine, clear, ſun-ſhine weather, and winds variable; after that again, often thick fogs and high winds.

5. It is very poſſible, by ſteering North or N. N. E. by the ſhip's compaſs, (if it can be ſo contrived as to have the card on the needle ſteady, and the winds prove favourable,) with a little perſeverance, a ſhip may get near the Pole, if they do not meet with rocks.

VI.

SIR,

IN the year 1766, trade being dull, I fitted a ſhip at my ſole expence, to the Greenland ſeas; and the ſaid ſhip returned with one fiſh, eleven feet bone. Finding the trade could be conducted better in private hands than a company's, I was induced to ſend a ſecond ſhip in 1767, and as I had other concerns in ſhipping, thought it moſt prudent (being brought up to the ſea, and having made an eaſy fortune from it) to go a voyage to the Greenland ſeas, to ſee with my own eyes what chance there might be of making or loſing a fortune. So ſailed from Hull the 14th day of April, in my ſhip the Britiſh Queen, with an old experienced maſter, and on the 24th and 25th of April was in the latitude of 72°, catching ſeals amongſt great quantities of looſe ice. As we did not chooſe to ſtay in that latitude, we made the beſt of our way North; and after ſailing through looſe ice, which is commonly the caſe, about the 6th of May we were as far North as latitude 80°, (which is near what the maſters call *a fiſhing latitude*) and about 15 leagues Weſt of Hakluyt's Headland. I found the further North the leſs quantity of ice; and from the enquiry I made, both from the Engliſh and Dutch, which was very conſiderable, there is a great probability of ſhips going to the Pole, if not ſtopped by meeting land or rocks. It appeared to me, that the narroweſt

place

in thoſe ſeas was betwixt Spitzbergen and the American ſhore, where the current is obſerved to come always from the North, which fills this narrow place with ice, but in general looſe and floating in the ſummer, though I believe congealed and permanent in winter. Thoſe from whom I enquired informed me, that the ſea was abundantly clearer to the North of Spitzbergen, and the further North the clearer. This ſeems to prove a wide ocean and a great opening to the North, as the current comes from thence that fills this paſſage as aforeſaid. The beſt method of reaching the higheſt latitude in my opinion is, to hire two veſſels of about 250 tons burthen each, and if done on a frugal ſcheme, the ſame ſhips might be fitted for the whale fiſhery, and premiums given both for the uſe of the ſhip and crew, in proportion to their approach to the Pole, which, from many circumſtances that may intervene, might be two or three years before they could complete their wiſhes. And it is more likely they might make their fiſhery ſooner than to the Southward; as, if they met with ice, the fiſh would be undiſturbed; if clear water and a good wind, they very ſoon might reach the Pole. What I mean by two veſſels is, one to foreſail the other at the diſtance of three or four leagues, as the latter may avoid the dangers the firſt might run into; and to be always ready, on ſeeing and hearing proper ſignals, to aid and aſſiſt, and by that means ſecure a retreat. I am alſo of opinion, that ſuch ſhips being ſent on diſcoveries are much more likely to

ſucceed than his majeſty's ſhips and officers. The above hints I have pointed out for your conſideration, and if I can be of any further ſervice, may command,

Sir, your moſt humble ſervant,

Hull,
March 4, 1775.

SAM. STANDIDGE.

AS it appears, by the two firſt collections of inſtances, that I have had much converſation with the officers of the royal navy, as well as maſters of Greenland ſhips, about a Polar voyage, I ſhall now ſtate ſeveral hints which have occaſionally dropped from them, with regard to proſecuting diſcoveries to the Northward.

The ſhip ſhould be ſuch as is commonly uſed in the Greenland fiſhery, or rather of a ſmaller ſize, as it works the more readily when the ice begins to pack round it.

There ſhould, on no account, be a larger complement of men than can be conveniently ſtowed in the boats, as it ſometimes happens, that the Greenland veſſels are loſt in the ice; but the crews generally eſcape by means of their boats. The crew alſo ſhould conſiſt of a larger proportion of ſmiths and carpenters than are uſually put on board common ſhips.

As it may happen, that the crews in boats may be kept a conſiderable time before they can reach either ſhip or ſhore, there ſhould be a ſort of awning, to be uſed

uſed occaſionally, if the weather ſhould prove very inclement.

As it is not wanted that the boats ſhould laſt many years, it is adviſed, that they ſhould be built of the lighteſt materials, as on this account they are more eaſily dragged over the packed ice.

As it is poſſible alſo, that the crew may be obliged to winter within the Arctic circle, it is recommended, that the ſhip ſhould be ballaſted with coals.

That there ſhould be a framed houſe of wood on board, to be made as long as poſſible, for the opportunity of exerciſe within doors(a).

That there ſhould be a Ruſſian ſtove on board, as a fire in a common chimney does not warm the room equally.

It appears, by the accounts of the Dutch who wintered in Nova Zembla, as well as the Ruſſians who continued ſix years in Maloy-Brun, that during this ſeaſon there are ſometimes days of a tolerable temperature; ſnow ſhoes, therefore, ſhould be provided, as alſo ſnow eyes, not to loſe the benefit of air and exerciſe during ſuch an interval. The beard likewiſe ſhould be ſuffered to grow on the approach of winter, from which the Ruſſian couriers are enabled to ſupport the ſeverity of the open air.

Ruſſian

(a) On the Labradore Coaſt the furriers raiſe a wall of earth all round their huts, as high as the roof, which is found to contribute much to warmth within doors, ſo as to want little more heat than ariſes from the ſteam of lamps. Such wall is commonly three feet thick.

Ruſſian boots, and the winter cap of the furriers of North America, is alſo recommended; but recourſe ſhould not be had to this warmeſt cloathing upon the firſt approach of winter, for by theſe means the Ruſſians do not commonly endure cold ſo well as the Engliſh; becauſe when the weather becomes exceſſively ſevere, they cannot well add to their warmth.

When the weather is very inclement, leads for the hands, dumb bells, and other ſuch exerciſes ſhould be contrived for within-doors.

In order to prevent the ſcurvy likewiſe, frequent uſe of the fleſh-bruſh is recommended, as alſo occaſionally a warm bath, from which James's crew received great benefit, when they wintered on Charlton Iſland.

With regard to the proviſions, I ſhall here inſert a method of curing meat, communicated to me by Admiral Sir Charles Knowles, the good effects of which both himſelf and others have frequently experienced(b).

The

(b) So ſoon as the ox is killed, let it be ſkinned and cut up into pieces fit for uſe, as quick as poſſible, and ſalted whilſt the meat is hot; for which purpoſe, have a ſufficient quantity of ſalt-petre and bay-ſalt pounded together, and made hot in an oven, of each equal parts; with this ſprinkle the meat, at the rate of about two ounces to the pound. Then lay the pieces on ſhelving boards to drain for 24 hours; which done, turn them and repeat the ſame operation, and let them lay for 24 hours longer, by which time the ſalt will be all melted, and have penetrated the meat, and the juices be drained off. Each piece muſt then be wiped dry with clean coarſe cloths, and a ſufficient quantity of common ſalt, made hot likewiſe in an oven, and mixed (when taken out) with about one-third brown ſugar. The caſks being ready, rub each piece well with

The flour ſhould be kiln-dried, and put into tight barrels which are capable of holding liquids. Flour thus preſerved and packed hath been perfectly good for more than three years, without the leaſt appearance of the weevils.

To make the beſt uſe of flour thus preſerved, there ſhould be both a biſcuit-maker and an oven on board.

With regard to liquors, a large quantity of ſhrub from the beſt ſpirits and fruits is recommended, which ſhould alſo be made juſt before the voyage takes place; the ſtronger the ſpirit, the leſs ſtowage.

I ſhould ſtand in need of many apologies, for having ſuggeſted theſe hints to Northern diſcoverers, had I not received them from officers of the royal navy, as well as Greenland maſters and phyſicians; if any one of theſe particulars, however, would not have been otherwiſe thought of upon fitting out the ſhip for ſuch a voyage, and ſhould be attended with any good effects, it will become my beſt excuſe.

In order alſo to promote ſuch a voyage of diſcovery, I ſhould conceive, that extending the parliamentary reward of twenty thouſand pounds by 18 G. II. c. 17. for

with this mixture, and pack them well down, allowing about half a pound of the ſalt and ſugar to each pound of meat, and it will keep good ſeveral years.

N. B. It is beſt to proportion the caſks or barrels to the quantity conſumed at a time, as the ſeldomer it is expoſed to the air the better. The ſame proceſs does for pork, only a larger quantity of ſalt, and leſs ſugar; but the preſervation of both equally depends on the meat's being hot when firſt ſalted.

for the paſſage to the Pacific Ocean through Hudſon's Bay, to a Northern communication between the Atlantic and Pacific Oceans in any direction whatſoever, might greatly contribute to the attempting ſuch an enterprize.

To this, another incitement might be perhaps added, by giving one thouſand pounds for every degree of Northern latitude which might be reached by the adventurer from 85° to the Pole, as ſome ſo very peremptorily deny all former inſtances of having reached ſuch high latitudes.

I ſhall conclude, however, in anſwer to their incredulity, by the following citation from Hakluyt:

" Now leaſt you ſhould make ſmall account of " ancient writers, or of their experience, which tra- " velled before our times, reckoning their authority " amongſt fables of no importance, I have, for the " better aſſurance of thoſe proofs, ſet down part of a " diſcourſe written in the Saxon tongue, and tranſlated " into Engliſh by M. Nowel, ſervant to maſter ſecre- " tary Cecil, wherein is deſcribed a navigation, which " one Ochter made in the time of king Alfred, king of " Weſt Saxe, anno 871; the words of which diſcourſe " are theſe: 'He ſailed right North, having always the " deſert land on the ſtarboard, and on the larboard the " main ſea, continuing his courſe until he perceived " the coaſt bowed directly towards the eaſt, &c.' " Whereby it appeareth, that he went the ſame way " that we do now yearly trade by St. Nicholas into " Moſcovia, which no man in our age knew for cer-

" tainty

" tainty to be ſea, till it was again diſcovered by the " Engliſh in the time of Edward VI.

" Nevertheleſs, if any man ſhould have taken this " voyage in hand, by the encouragement of this only " author, he ſhould have been thought but ſimple, " conſidering that this navigation was written ſo many " years paſt, in ſo barbarous a tongue, by one only " obſcure author; and yet, in theſe our days, we find " by our own experience, his reports to be true."

THOUGHTS

ON THE

PROBABILITY, EXPEDIENCY, AND UTILITY

OF

DISCOVERING A PASSAGE

BY THE

NORTH POLE.

THOUGHTS, &c. (*)

THE poſſibility of making diſcoveries in this way (that is, by ſteering directly North) though now treated as paradoxical by many, was not, as will hereafter appear, formerly looked upon in that light, even by ſuch as ought to be reputed the propereſt judges. There have been a variety of cauſes that at different times have retarded undertakings of the utmoſt importance to the human ſpecies. Amongſt theſe we may juſtly conſider the conduct of ſome great philoſophers, who, as our judicious Verulam wiſely obſerves, quitting the luminous path of experience to inveſtigate the operations of nature, by their own ſpeculations, impoſed upon the bulk of mankind ſpecious opinions for inconteſtable truths; which being propagated by their diſciples, through a long ſeries of years, captivated the minds of men, and thereby deprived them of that great inſtru-

(*) I have lately received theſe reflections from a learned friend, who permits me to print them, though not to inform the public to whom they are indebted for this very valuable communication. D. B.

inſtrument of ſcience, the ſpirit of enquiry (a). In ſucceeding ages a new impediment aroſe from the ſetting up profit as the ultimate object of diſcovery; and then, as might well be expected, the preferring the private and particular gain of certain individuals to the general intereſts of the community, as well as to the intereſt of the whole world, in the extenſion of ſcience. This it was that induced the States General, at the inſtance of their Eaſt India Company, to diſcourage all attempts for finding a North Eaſt paſſage, and to ſtifle ſuch accounts as tended to ſhew that it was practicable. We may add to theſe, the ſourneſs of diſappointed navigators who endeavoured to render their own miſcarriages proofs of the impracticability of any like attempts. This was the caſe of Captain Wood, who was ſhipwrecked upon Nova Zembla, and who declared, that all endeavours on that ſide were, and would be, found vain; though Barentz, who died there in a like expedition, affirmed, with his laſt breath, that, in his own opinion, ſuch a paſſage might be found.

That the earth was ſpherical in its form, was an opinion very early entertained, and amongſt the learned generally admitted. It ſeemed to be a plain deduction from thence, that a right line, paſſing through the globe, would terminate in two points diametrically oppoſite. Plato is thought to be the firſt who ſpoke of the inhabitants

(a) Baconi Opera, tom. IV. p. 100. *et alibi paſſim.* But theſe paſſages may be found collected in Shaw's Abridgement of Bacon's Works, vol. II. p. 52.

inhabitants (if ſuch there were) dwelling at or near thoſe points, by the name of Antipodes. This doctrine occaſioned diſputes amongſt philoſophers for many ages; ſome maintained, ſome denied, and ſome treated it as abſurd, ridiculous, and impoſſible(b). Whoever will examine impartially the ſentiments of theſe great men, weigh the contrariety of their opinions, and conſider the ſingularity of their reaſonings, will ſee and be convinced how unſatisfactory their notions were, and diſcover from thence, how inſufficient the ſubtle ſpeculations of the human underſtanding are towards ſettling points like theſe, when totally unaſſiſted by the lights of obſervation and actual experience.

The diviſion of the globe by zones being agreeable to nature, the ancients diſtinguiſhed them very properly and accurately into two frigid, between the Poles, the Arctic and Antarctic circles; two temperate, lying between thoſe circles and the tropics; and the torrid zone within the tropics, equally divided by the equinoctial. But judging from their experience, of the nature of the climates at the extremities of the zone which they inhabited, they concluded, that the frigid zones were utterly uninhabitable from cold, and the torrid from intolerable heat of the Sun. Pliny laments very pathetically upon this ſuppoſition, that the race of mankind

(b) Lucr. de Natura Rerum, lib. I. ver. 1063. Cicer. Acad. Quæſt. lib. IV. Plin. Hiſt. Natural. lib. II. cap. 65. Plutarch. de Facie in Orbe Lunæ. Macrob. de Somn. Scip. lib. II.

kind were pent up in ſo ſmall a part of the earth. The poets, who were alſo no deſpicable philoſophers, heightened the horrors of theſe inhoſpitable regions by all the colouring of a warm and heated imagination(c); but we now know, with the utmoſt certainty, that they were entirely miſtaken as to both. For within the Arctic circle there are countries inhabited as high nearly as we have diſcovered; and, if we may confide in the relations of thoſe who have been neareſt the Pole, the heat there is very conſiderable, in reſpect to which our own navigators and the Dutch perfectly agree. In regard to the torrid zone, we have now not the leaſt doubt of its being thoroughly inhabited; and which, is more wonderful, that the climates are very different there, according to the circumſtances of their ſituation. In Ethiopia, Arabia, and the Moluccas, exceedingly hot; but in the plains of Peru (and particularly at Quito) perfectly temperate, ſo that the inhabitants never change their cloaths in any ſeaſon of the year. The ſentiments of the ancients therefore in this reſpect, are a proof how inadequate the faculties of the human mind are to diſcuſſions of this nature, when unaſſiſted by facts.

The

(c) Cicero in Somnium Scipionis. Virgil. Georg. lib. I. Ovidii Met. lib. I. Tibullus Panegyr. ad Meſſalam, lib. IV. Plin. Hiſt. Natural. lib. II. cap. 68. Pomp. Mela de Situ Orbis, lib. I. cap. 1. Claudian. de Raptu Proſerpinæ, lib. I.

The Pythagorean ſyſtem of the univerſe reviſed, and reſtored near two hundred and fifty years ago by the celebrated Copernicus, met with a very difficult and ſlow reception, not only from the bulk of mankind, for that might have been well expected, but even from the learned; and ſome very able aſtronomers attempted to overturn and refute it (d). Galileo Galilei wrote an admirable treatiſe in its ſupport, in which he very fully removed moſt of the popular objections (e). This, however, expoſed him to the rigour of the inquiſition, and he was obliged to abjure the doctrine of the earth's motion. Our noble philoſopher, the deep and acute Lord Verulam, could not abſolutely confide in the truth and certainty of the Copernican ſyſtem; but ſeems to think, that its facilitating aſtronomical calculations was its principal recommendation, as if this had not been alſo a very ſtrong preſumption at leaſt, if not a proof of its veracity (f). It was from this conſideration

 that

(d) Amongſt the moſt conſiderable of theſe was John Baptiſt Riccioli, who publiſhed his *Almageſtum Novum* with this view. Yet afterwards in his *Aſtronomia Reformata*, he found himſelf obliged to have recourſe to the doctrine of the earth's motion, that he might be able to give his calculations with a proper degree of exactneſs.

(e) This celebrated work of his was entitled, *Dialoghi de Siſtemi di Tolomeo e di Copernico*. This is much better known to the learned world by a Latin tranſlation, which ſo clearly proved the ſuperiority of the Copernican ſyſtem, that the only means of refuting it was by the cenſures of the church.

(f) Shaw's Abridgment of Bacon's Works, vol. II. p. 21. where the doctor endeavours to defend this opinion.

that the church of Rome at length thought fit ſo far to relax in her deciſions, as to permit the maintaining the earth's motion in phyſical and philoſophical diſquiſitions. But Sir Iſaac Newton, who built upon this baſis his experimental philoſophy, hath diſperſed all doubts on this ſubject, and ſhewn how the moſt ſublime diſcoveries may be made by the reciprocal aids of ſagacity and obſervation. On theſe grounds, therefore, all enquiries of this nature ought to proceed, without paying an implicit ſubmiſſion to the mere ſpeculative notions even of the greateſt men; but purſuing ſteadily the path of truth, under the direction of the light of experience.

It may be urged, in excuſe of the ancients, and even of our anceſtors in former times, that as they were unaſſiſted by facts, they could only employ gueſs and conjecture, and that conſequently their concluſions were from thence erroneous. But to wave the viſible impropriety of deciding in points (where obſervation was ſo obviouſly neceſſary) without its direction; let us ſee whether this plea of alleviation may not be controverted in both caſes. Cornelius Nepos reports, that ſome Indians being caſt on ſhore in Germany, were ſent by a prince of the Suevi to Quintus Metellus Celer, then the Roman proconſul in Gaul(g). A very learned writer in diſcuſſing this point hath ſhewn, that it was poſſible for theſe Indians to have come by two different routs into the Baltic. He thinks, however, that it is very

(g) Plin. Hiſt. Nat. lib. II. cap. 67.

very improbable they came by either, and ſuppoſes that they were either Norwegians, or ſome other wild people to whom, from their ſavage appearance, they gave the name of Indians(b). But though this obſervation may well enough apply to the Romans, who at that time had no knowledge of theſe Northern people, yet it is not eaſy to conceive, that the Suevi could fall into this miſtake; or if they did not, that they ſhould attempt to impoſe upon the Romans. It appears inconteſtably, that in the time of king Alfred, the Northern ſeas were conſtantly navigated upon the ſame motives they are now; that is, for the ſake of catching whales and ſea-horſes(i). Nicholas of Lynn, a Carmelite friar, ſailed to the moſt diſtant iſlands in the North, and even as high as the Pole. He dedicated an account of his diſcoveries to King Edward the Third, and was certainly a perſon of great learning and an able aſtronomer(k), if we may believe the celebrated Chaucer, who, in his Treatiſe on the Aſtrolabe, mentions him with great reſpect.

After

(b) Huet Hiſtoire de Commerce et de la Navigation des Anciens, p. 351.

(i) See Barrington's Tranſlation of Oroſius from the Anglo-Saxon of king Ælfred, part II. p. 9.

(k) Leland. Comment. de Script. Britan. cap. 370. Bale, vi. 25. Pits, p. 505. His deſcription was intituled *Inventio Fortunata*; beſides which, he wrote, among other things, a book, *De Mundi Revolutione*, which poſſibly may ſtill remain in the Bodleian Library. This friar, as Dr. Dee aſſerts, made five voyages into theſe Northern parts, and left an account of his diſcoveries from the latitude of 54° to the Pole.

After Columbus diſcovered America under the auſpices of Ferdinand and Iſabella, the ſovereigns of Europe, and eſpecially Henry the Seventh, turned their thoughts towards, and gave great encouragement to diſcoveries. Mr. Robert Thorne, who reſided many years as a merchant in Spain, and who was afterwards mayor of Briſtol, wrote a letter to Henry the Eighth, in which he ſtrongly recommended a voyage to the North Pole. He gave his reaſons more at large in a long memorial to our ambaſſador in Spain, which ſhew him to have been a very judicious man, and for thoſe times a very able coſmographer, and accompanied this memorial with a map of the world, to ſhew the practicability of his propoſal(l). Though this project of his was not attended to, yet a variety of expeditions were made for diſcovering a paſſage by the North-weſt, and others by the North-eaſt, into the South Seas on the one ſide, and into the Tartarian Ocean on the other, until at length both were declared impracticable by Captain James and Captain Wood; ſoured by their own miſcarriages, and being ſtrongly perſuaded, that as they did not ſucceed, none elſe could. But even theſe unſucceſsful voyages were not unprofitable to the nation upon the whole, as they opened a paſſage to many lucrative fiſheries, ſuch as thoſe in Davis's Straits, Baffin's

(l) Hakluyt's Voyages, vol. I. p. 212—220. The letter to Dr. Ley, who was the king's ambaſſador in Spain, is dated *A. D.* 1527. This Mr. Thorne's father was engaged, with others, in the diſcovery of Newfoundland.

Baffin's Bay, and on the Coaſt of Spitzbergen. Beſides this, they laid open Hudſon's Straits and Bay with the Coaſts on both ſides, which have been already productive of many advantages, and which, in proceſs of time, cannot fail of producing more, in conſequence of our being in poſſeſſion of Canada, and being thereby ſole maſter of thoſe ſeas and coaſts.

It is, however, very remarkable, that notwithſtanding the views, both of our traders and of ſuch great men as were diſtinguiſhed encouragers of diſcoveries, the ableſt ſeamen (who without doubt are the beſt judges) were ſtill inclined to this paſſage by the North, ſuch as Captain Poole, Sir William Monſon[m], and others; and this was ſtill the more remarkable, as they were entirely guided therein by the lights of their own experience, having no knowledge of Mr. Thorne's propoſal, or of the ſentiments of each other. From the reaſon of the thing, however, they uniformly concurred in the motives they ſuggeſted for ſuch an undertaking. They aſſerted, that this paſſage would be much ſhorter and eaſier than any of thoſe by the North-weſt or North-eaſt; that it would be more healthy for the ſeamen, and attended with fewer inconveniencies; that it would probably open a paſſage to new countries; and finally, that the experiment might be made with very little hazard, at a ſmall expence, and would redound highly to our national honour, if attended with ſucceſs. It may

(m) Naval Tracts, p. 435.

may be then demanded, why it has not hitherto been attempted, and what objections have retarded a ſcheme ſo viſibly advantageous? Theſe objections, as far as they can be collected, are the fear of periſhing by exceſſive cold, the danger of being blocked up in ice, and the apprehenſion that there could be no certainty of preſerving the uſe of the compaſs, under or near the Pole.

In reſpect to the firſt, we have already mentioned that the ancients had taken up an opinion, that the ſeas in the frigid zone were impaſſable, and the lands, if there were any, uninhabitable. The philoſophers of later ages fell into the ſame opinion, and maintained that the Poles were the ſources and principles of cold, which of courſe increaſed and grew exceſſive in approaching them(n). But when the lights of experience were admitted to guide in ſuch reſearches, the truth of this notion came to be queſtioned, becauſe from facts it became probable, that there might be a diverſity of climates in the frigid as well as in the torrid zone. Charlton Iſland, in which Captain James wintered, lies in the bottom; that is, in the moſt Southern part of Hudſon's Bay, and in the ſame latitude with Cambridge, and the cold there was intolerable. The ſervants of the Hudſon's Bay Company trade annually in places ten degrees

(n) In the language of thoſe times, the Pole was ſtiled *Primum Frigidum*; and it was by ſuch groundleſs phraſes that men pretended to account for the operations of nature, without giving themſelves the trouble of experimental enquiries.

degrees nearer the Pole, without feeling any ſuch inconvenience. The city of Moſcow is in the ſame latitude with that of Edinburgh, and yet in winter the weather is almoſt as ſevere there as in Charlton Iſland. Nova Zembla hath no ſoil, herbage, or animals; and yet in Spitzbergen, in ſix degrees higher latitude there are all three, and on the top of the mountains in the moſt Northern part, men ſtrip themſelves of their ſhirts that they may cool their bodies (o). The celebrated Mr. Boyle, from theſe and many other inſtances, rejected the long received notion that the Pole was the principle of cold. Captain Jonas Poole, who in 1610 ſailed in a veſſel of ſeventy tons to make diſcoveries towards the North, found the weather warm in near ſeventy-nine degrees of latitude, whilſt the ponds and lakes were unfrozen, which put him in hopes of finding a mild ſummer, and led him to believe, that a paſſage might be as ſoon found by the Pole as any other way whatever; and for this reaſon, that the Sun gave a great heat there, and that the ice was not near ſo thick as what he had met with in the latitude of ſeventy-three (p). Indeed the Dutchmen who pretend to have advanced within a degree of the Pole, ſaid it was as hot there as in the ſummer at Amſterdam.

In theſe Northern voyages we hear very much of ice, and there is no doubt that veſſels are very much hindered

(o) See Marten's Account of Spitzbergen, p. 105.
(p) Purchas Pilgrims, vol. III. p. 702.

dered and incommoded thereby. But after all, it is, in the opinion of able and experienced ſeamen, more formidable in appearance than fatal in its effects. When our earlieſt diſcoveries were made, and they reached farther North than we commonly ſail at preſent, it was performed in barks of ſeventy tons, with ſome trouble, no doubt, but with very little hazard. At this day it is known, that in no part of the world there are greater quantities of ice ſeen than in Hudſon's Bay, and yet there is no navigation ſafer, the company not loſing a ſhip in twenty years, and the ſeamen who are uſed to it, are not troubled with any apprehenſions about it. It is no objection to this, that we hear almoſt every ſeaſon of ſhips loſt in the ice on the whale fiſhery; for theſe veſſels, inſtead of avoiding induſtriouſly ſeek the ice, as amongſt it the whales are more commonly found, than in the open ſea. Being thus continually amongſt the ice, it is no wonder that they are ſometimes ſurrounded by it; and yet the men, when the ſhips are loſt, generally ſpeaking, eſcape. But in the ſeas near the Pole, it is very probable, there is little or no ice, for that is commonly formed in bays and rivers during winter, and does not break up and get into the ſea till the latter end of March or the beginning of April, when it begins to thaw upon the ſhores. It is alſo, when formed, very uncertain as to its continuance, being broken and driven about by the vehemence of the winds. As a proof of this we have an inſtance of a veſſel frozen in one of the harbours

bours of Hudſon's Bay, which, by the breaking of the ice, drove to ſea, and though it was Chriſtmas, found the Straits quite free from ice(q), which are frequently choaked with it in May and June, and made a ſafe and ſpeedy paſſage home. All our accounts agree that in very high latitudes there is leſs ice. Barentz, when his ſhip was frozen in Nova Zembla, heard the ice broken with a moſt horrible noiſe, by an impetuous ſea from the North, a full proof that it is was open. It is the invariable tradition of the Samoides and Tartars, who live beyond the Waygat, that the ſea is open to the North of Nova Zembla all the year; and the moſt knowing people in Ruſſia are of the ſame opinion. Theſe authorities ought certainly to have more weight than ſimple conjectures.

The notion that approaching to a paſſage under the Pole would deſtroy the uſe of the compaſs, is a popular opinion without any juſt grounds to ſupport it. For it preſumes that the needle is directed by the Pole of the World; which it certainly is not, as appears from the needle's variation, and even the variation of that variation, which if this notion was true, could never happen. In Sir Thomas Smith's ſound in Baffin's Bay, the variation was found to be fifty-ſix degrees Weſtward, the greateſt yet known. Captain Wood is very clear upon this point, and maintains, that no danger was to be

(q) Mr. Dobbs's Account of Hudſon's Bay, p. 69, 70.

apprehended from this cauſe(r). Thoſe who aſſerted, that they had advanced within a degree of the Pole, eſtimated the variation there at five points of the compaſs. Captain Wood in ſtating the account given of the Dutch ſeamen's voyage by Captain Goulden, omits one very material point, of which we are informed by Mr. Boyle, which is, that one of the Dutch captains coming over to England, Captain Goulden carried him to ſome of the Northern Company, who were perfectly ſatisfied as to the truth of his relation(s). On the whole, therefore, whether we reſpect reaſon or facts, there are no juſt grounds for apprehenſions on this head, more eſpecially as there are other means by which the true ſituation of a veſſel might be determined, and the difficulty, if any aroſe, would be but of very ſhort continuance. But as ſuch a voyage could not fail of affording many new lights in reſpect to aſtronomy and geography, ſo in this reſpect alſo, it muſt neceſſarily aſcertain fully what is at preſent only matter of doubt and conjecture.

As notions long received acquire from thence a degree of credit due only to truth; and as new opinions, contrary to theſe, and in other reſpects perhaps extraordinary in themſelves, meet from theſe cauſes with

(r) Wood's Voyage for the Diſcovery of a North-caſt Paſſage, p. 139.

(s) See the honourable Mr. Boyle's Hiſtory of Cold, in reſpect to this and a multitude of other curious particulars, which ſhew with how much induſtry and care he ſtruggled to deliver truth from vulgar errors and fiction.

with ſlow and difficult belief, however they may appear to be ſupported by arguments, authorities, or facts (which it is preſumed have been freely and fairly urged in the preſent caſe, to a degree that may at leaſt entitle the matter to ſome attention), let us now proceed one ſtep further. This ſhall be to ſhew, that what ſeems to be ſo repugnant to the common courſe of things (*viz.* that near the North Pole the cold ſhould relax, and the ice be leſs troubleſome) is perfectly conformable to the laws of nature, or which is the ſame thing, to the will and wiſdom of our great Creator. If this can be proved, there can be no farther diſpute as to the poſſibility of this paſſage; more eſpecially when it ſhall alſo appear, that this affords a full ſolution of all the doubts that have been ſuggeſted, and at the ſame time clearly accounts for, and effectually confirms, the facts and reaſonings deduced from them, which have been already advanced upon this ſubject. To come then at once to the point.

Sir Iſaac Newton, who it is univerſally allowed was equally accurate, cautious, and judicious in his philoſophical deciſions, hath demonſtrated clearly, that the figure of this our earth is not ſpherical, but of an oblate ſpheroidal form, the diameter at the equator being the greateſt, and at the axis the leaſt of all the lines that can paſs through the center. He alſo determined, by a moſt curious calculation, the proportion of theſe diameters to be as two hundred and thirty, to two hundred and twenty-nine. Theſe ſentiments of his have been

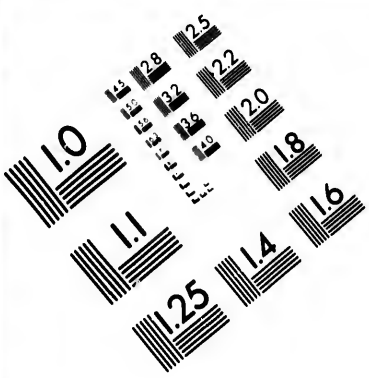
expe-

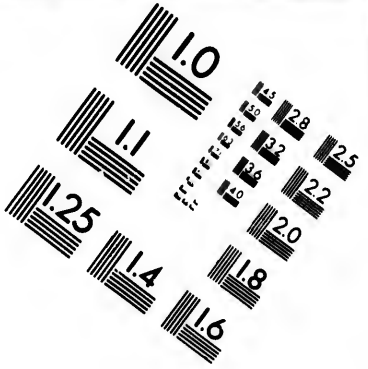
experimentally verified by the means which he alſo pointed out, *viz.* obſerving the motion of pendulums in very different latitudes, and the actual meaſurement of a degree at the equator and under the Arctic circle. This laſt evidently proved the depreſſion of the earth's ſurface towards the Pole, which no doubt gradually increaſes. The very learned and ſagacious Dr. Hooke aſſerted, in one of his lectures, and brought very ſtrong reaſons to ſhew, that there is nothing but ſea at the Poles(*t*). Theſe points then being maturely conſidered will be found to militate in favour of a free paſſage this way, and at the ſame time give much light into other things that have been advanced, in the courſe of this enquiry, by ſhewing the true cauſes of thoſe facts that, at firſt ſight, have appeared to many very ſtrange and unaccountable. For example, if there be no land near the Pole, then there can be no bays in which ice can be formed to interrupt the navigation. Again, the rays of the Sun falling on ſo flat a ſurface, and being continually reflected from the water, muſt afford a great degree of heat to the air. At the ſame time this will account for the Sun's being ſeen by the Dutch in Nova Zembla a fortnight earlier than he ſhould have appeared, according to aſtronomical calculations(*u*). Many other circumſtances might be mentioned, but theſe will doubtleſs occur to the intelligent, and therefore it is unneceſſary to dwell longer upon them. The

(*t*) Hooke's poſthumous Works, p. 351.

(*u*) See Purchas, vol. III. p. 499, 500.

The great injuſtice of rejecting opinions, on account of their appearing, at firſt ſight, paradoxical, or ſomewhat inconſiſtent with notions commonly received, having been clearly ſhewn, and the miſchievous conſequences flowing from it by various inſtances pointed out; the foundation of this conjecture, that there may be a paſſage near the Pole, having been fairly ſtated, the popular objections to it clearly removed, the general advantage (that might be expected from thence) placed in a proper light, and the conſiſtence of all the circumſtances relative thereto, with the eſtabliſhed courſe of nature, having been alſo rendered evident; there can be nothing more looked for reſpecting this matter merely in the light of a philoſophical ſpeculation. But if ſupporting this had been the only motive, theſe reflections had not employed the time of the writer, or treſpaſſed ſo long upon the reader's patience. What then remains? To demonſtrate, that as the poſſibility, practicability, and facility of ſuch an undertaking have been inſiſted upon, its national utility ſhould be ſhewn to deſerve conſideration; and that, as it is an object of the greateſt importance to the public welfare, its execution ſhould be no longer delayed. There is unqueſtionably no country in Europe ſo well ſituated for ſuch an enterprize as this. The tranſit from Shetland to the Northern parts of Aſia would, by this way, be a voyage only of a few weeks. The inhabitants of theſe iſlands and of the Orkneys are, and have been, for many years employed in the Greenland fiſheries,





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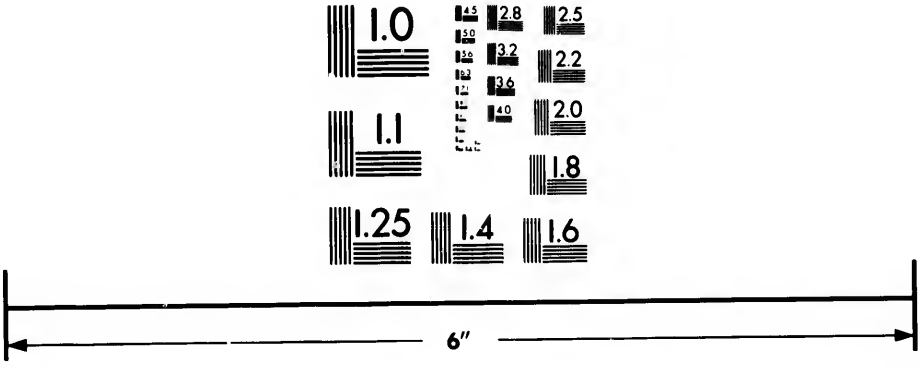

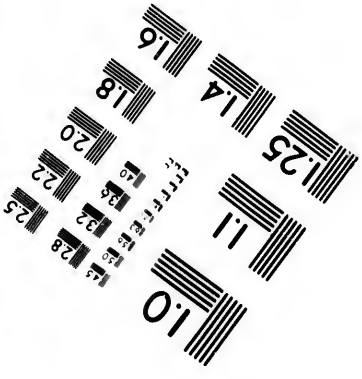

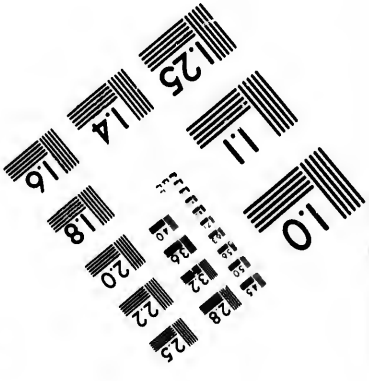

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and the natives of theſe iſles are the perſons moſtly ſent to the eſtabliſhments in Hudſon's bay. By theſe means they are inured to cold, to ice, and hard living, and are conſequently the fitteſt for being employed in ſuch expeditions. When this ſhall be once executed with ſucceſs, it will neceſſarily bring us acquainted with new Northern countries, where ordinary cloaths and other coarſe woollen goods will probably be acceptable, new channels of commerce would be thereby opened, our navigation extended, the number of our ſeamen augmented, without exhauſting our ſtrength in ſettling colonies, expoſing the lives of our ſailors in tedious and dangerous voyages through unwholeſome climates, or having any other trade in proſpect than that of exchanging our native commodities and manufactures, for thoſe of other countries. This, if it could be brought about, would in the firſt inſtance, convert a number of bleak and barren iſlands into cultivation, connect them and their inhabitants intimately with Britain, give bread to many thouſands, and by providing ſuitable rewards for many different ſpecies of induſtry, encourage population, and put an eaſy and effectual period to the miſchiefs and ſcandal of emigrations. The benefits derived from theſe diſcoveries, and the commerce ariſing from them, will neceſſarily extend to all parts of our dominions. For however fit the poor people of thoſe iſlands may be for ſuch enterprizes, or however commodious the ports in their countries may be found for equipping and receiving veſſels employed in theſe voyages, yet the com-

commodities, manufactures, &c. muſt be furniſhed from all parts of the Britiſh empire, and of courſe be of univerſal advantage. Theſe, as they are true, will it is hoped appear juſt and cogent reaſons for wiſhing, that a project which has dwelt in the mouths and memories of ſome, and in the judgement and approbation of a few, from the time of Henry the Eighth, ſhould be revived, and at length, for the benefit of his ſubjects, carried into effect, under the auſpices of GEORGE the Third.

FINIS.

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ERRATA.

Page 27. Note *(l)* line 5. *for* 78° 30′ *read* 79 degrees.

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