

LVIII. *An extraordinary and surprising Agitation of the Waters, though * without any perceptible Motion of the Earth, having been observed in various Parts of this Island, both maritime and inland, on the same Day, and chiefly about the Time, that the more violent Commotions of both Earth and Waters so extensively affected many very distant Parts of the Globe; the following Accounts, relating to the former, have been transmitted to the Society; in which are specified the Times and Places when and where they happened.*

L E T T E R I.

*From Mr. John Robertson, F. R. S. to Tho. Birch,
D. D. Secret. R. S.*

At Portsmouth, in Hampshire.

S I R,

Read Nov. 27, 1755. **T**HE first notice I had of any uncommon motion of the waters in the docks at Portsmouth, was by the Whitehall Evening-Post; and as I did not hear any particulars from my acquaintance in the yard, I thought no more of it. But on the receipt of your letter I made a minute inquiry among the persons, who saw it, of whom there were many, and the substance of their information is as follows.

On Saturday, Nov. 1, 1755, about 35 minutes after ten in the morning there was observed in the

* See the note on the letter from R. Philips.

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dock-yard at Portsmouth an extraordinary motion of the waters in the north dock, and in the basin, and at two of the jetty-heads.

In the north dock, whose length is about 229 feet, breadth 74 feet, and at that time about $17\frac{1}{2}$ feet depth of water, shut in by a pair of strong gates, well secured, his Majesty's ship the Gosport of 40 guns, was just let in to be dock'd, and well-stay'd by guys and hawsers (certain large ropes so called). On a sudden the ship ran backwards near three feet, and then forwards as much, and at the same time she alternately pitch'd with her stern and head to the depth of near three feet; and, by the libration of the water, the gates alternately opened and shut, receding from one another near four inches.

In the basin, whose length is about 240 feet, breadth 220 feet, and at that time about 17 feet depth of water, shut in by two pair of gates, lay the Berwick of 70 guns, the Dover of 40 guns, both in a direction nearly parallel to the Gosport; and a merchant ship of about 600 tons, unloading of tar, lying in an oblique direction to the others. These ships were observed to be agitated in like manner with the Gosport, and the tar-ship to roll from side to side: The swell of the water against the sides of the basin was observed to be nine inches; one of the workmen measured it between the librations.

The Nassau, a 70 gun ship, lying along-side a jetty-head, between the north dock and the basin; also the Duke, a 90 gun ship, lying against the next jetty-head, to the southward, both in a direction nearly at right angles to the others, were observed to be

be rock'd in the same manner, but not quite so violently: These two ships lay in the harbour.

I cannot learn, that the motion was observed in any other of the ships lying in the harbour, or by any person on land, not even by those, who stood near the borders of the dock, basin, and jetties, and saw the motion of the ships.

The dock and basin lie nearly east and west, on the west side of the harbour. I am,

Portsea, Nov.
23, 1755.

S I R,
Your most humble
and obedient servant,
J. Robertson.

LETTER. II.

From Philip Carteret Webb, Esquire, F.R.S. to
Thomas Birch, D.D. Secr. R. S.

In Sussex, and the Southern Parts of Surrey.

S I R, Busbridge, Nov. 10, 1755.
Read Nov. 20, 1755. **Y**OU probably have had a circumstantial account of the extraordinary motion of the water in the dock and basin at Portsmouth, the first of November, between ten and eleven in the morning. An appearance something like it was observed about the same time, in several confined waters in different parts of Sussex and Surrey.

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In my garden at Busbridge, near Godalmin in Surrey, on Saturday the first of November 1755, at half an hour after ten in the forenoon, Philip Smith, my gardener, and John Street, and John Johnson, two under-gardeners, were alarmed by a very unusual noise in the water, at the east end of the long canal, near which John Street and John Johnson were then at work. On their looking that way, they observed the water, in that part of the canal, in great agitation, attended with a considerable noise. The water soon raised itself in a heap or ridge, extending lengthwise about thirty yards, and between two and three feet above the usual level of the water; after which the heap or ridge heeled or vibrated towards the north, or left side of the canal, with great force, and flowed about eight feet over the grass walk on that side of the canal, quite up to the arch. On the water's returning back into the canal, it again raised itself into a heap or ridge in the middle; after which the heap or ridge heeled or vibrated with greater force towards the south, or right-hand side of the canal, and flowed over the grass walk, and thorough the rustic arch on that side; and drove a small stream of water, which runs thorough it, 36 feet back upwards, towards its source. During this latter motion, the bottom of the canal, on the north side, for several feet in width, was quite bare of water. The water being returned into the canal, the vibrations grew less and less, but so strong, as to make the water flow several times over the south bank of the canal, which is not so high as the north bank. In about a quarter of an hour from the first appearance the water became quiet and smooth as before. The motion of
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the water was, during the whole time, attended with a great perturbation of the sand from the bottom of the canal, and with a great noise, likened by the gardeners to that of water turning a mill. During the whole time the weather was remarkably still, there not being the least wind; and there was no tremor or motion of the earth felt on the sides of the canal. This is the substance of the account I collected from my gardeners; I being, when this appearance was observed, in London.

The canal is near 700 feet long from west to east, and is about 58 feet wide: there is a small spring, which constantly runs thorough it. The water at the east end, where this appearance was observed, usually pens from two to four feet, growing gradually deeper to the west end, where it pens to about ten feet. No motion was taken notice of in the water at the west end of the canal. The first vibration, which drove the water over the grass walks, was from south to north. The grass walk on the north side of the east end of the canal is 14 inches, and that on the south side about ten inches higher than the usual level of the water: the highest part of the walk, over which the water flowed, is about 20 inches above the water-level.

I am informed, that the water was affected about the same time in the following places.

In a mill-pond, at Medhurst in Sussex, the sudden agitation and swell of the water rolling toward the mill was so remarkable, that the miller imagined a sluice had been opened at the upper end of the pond, and had let a back-water into it; but upon search it was found to be shut as usual. Below the

mill the swell of the water was so great, as to drive the stream upwards, back into the conduit of the mill.

At Lee, in the parish of Whitley, in Surrey, about five miles from Busbridge, between Busbridge and Medhurst; the water in a canal or pond belonging to Mr. Luff was so violently agitated, that the gardener, on the first appearance, ran for help, thinking a number of otters were under the water, destroying the fish.

In a mill-pond, near Guilford in Surrey, a like swell and agitation of the water, I am told, was observed by several persons, one of whom stood all the time on a bridge of wood, over the pond. Not the least tremor or motion of the earth was, I am told, felt in any of these places, or at the bridge at Guilford. These are the circumstances I have been able to collect relating to this affair, which, if you think proper, you may communicate to the Society. I am,

Dear Sir,

Your most affectionate

and very obedient servant,

Philip Carteret Webb.

LETTER

LETTER III.

From Swithin Adee, M. D. F. R. S. to Philip Carteret Webb, Esq; F. R. S.

SIR, Guildford, Nov. 19, 1755.

Read Nov. 27, 1755. I Made inquiries at our mill, and of the neighbours near the river, but can hear nothing of the agitation of the water. Mr. Wright informs me, that he saw it in the back stream swell very considerably, and come with violence against the bank; but did not observe any sensible reflux; nor could he inform me in what direction the water moved. I am,

SIR,

Your most obedient humble servant,

S. Adee.

LETTER IV.

From Swithin Adee, M. D. F. R. S. to Philip Carteret Webb, Esq; F. R. S.

SIR, Guildford, Nov 25, 1755.

Read Nov. 27, 1755. I Have met with a very particular account of the agitation of the water on the 1st of this month. An old sensible serious man, at Mrs. Wilson's, in the parish of Cobham, was watering a horse in hand, at a pond close by the house, which is fed by springs, and had no current. The time he fixes

fixes was about ten in the morning, but their clock goes too slow. While the horse was drinking, the water ran away from the horse, and moved towards the south with swiftness, and in such a quantity, as left the bottom of the pond bare, then returned with that impetuosity, which made the man leap backwards, to secure himself from the sudden approach of the water. It went back again to the south, with a great swell, and returned again. Upon inspecting the place, I found the water must have risen above one foot. The ducks were alarmed at the first agitation, and flew all instantly out of the pond. The man observed, that there was a particular calm at this time of day. You will observe here were two fluxes and two refluxes seen distinctly. This phænomenon will not be very surprising, since we have heard of the earthquake in Spain and Portugal. I am,

S I R,

Your most faithful humble servant,

S. Adee.

L E T T E R V.

*From Mr. John Hodgson to Philip Carteret Webb,
Esq; F. R. S.*

S I R, Nov. 26, 1755, Six o'clock at night.

Read Nov. 27, 1755. **I** Have just been at Petworth, to view the fissure in the rock near that place, but do not think it remarkable enough to claim the Society's attention. By the best account I can get from

from the people on the spot, it was first discovered by the covering of earth being casually washed away. It was then a small chink, which was afterwards enlarged by children at play; and it is now about two feet wide at the mouth, and two yards high, exactly fronting the south. It is true, that farther in, it shews evident marks of a rent, or violent separation; for the rock on each side is jagg'd into similar breaks; but when this rent was made, is the question. It is certain, that it preceded the late extraordinary agitations of water; all the inhabitants agreeing, that it has continued in the state it is now in near three months. I threw several stones in, and heard them rattle against the sides for a considerable time. A boy was let down to fetch up a dog, that had been thrown in. He went to the length of a cart-rope and an half, which was tied to his body; and, by his account, it appears to be a sort of a concamerated room, though, he says, he did not reach the bottom, but stood upon the edge of a prominent rock. I was in hopes it would have afforded something to confirm the late motions of the water; but, from all circumstances, it seems to be of much longer standing.

As to the ponds near Medhurst, every body agrees, that there was an extraordinary swelling of the water the same day that phænomenon was remarked in yours. The water was thrown several feet above its banks, both at north-mill, at south-pond, and the pond in Lord Montacute's park; and at the first of these, upon its retreat, left some fishes upon dry land. I am, Sir,

Your obliged humble servant,

J. Hodgson.

L E T T E R

Extract of L E T T E R VI.

From Cranbrook in Kent, to William Tempest, Esq;
F. R. S.

Nov. 7. 1755.

Read Nov. 13, 1755. **T**HE people here are very much alarmed on account of an earthquake, which happened last Saturday, (Nov. the 1st). I felt nothing of it, but some people fancied they did. I do not hear, that the earth moved; only the waters of several ponds, in this and the adjacent parishes, were in such motion, that they overflowed their banks, and then returned back, and overflowed the other side.

Extract of L E T T E R VII.

Communicated by John Pringle, M. D. F. R. S.

Chevening, in Kent, Nov. 16, 1755.

Read Nov. 20, 1755. **T**HE accounts from Portsmouth, and other places, about the agitation of the water, I now more readily believe, as the same thing has happened at Tunbridge-town, in the river there, and in a pond at a place, a few miles from hence, called Eaton-bridge; the particulars of which were told to one of our servants by an eye-witness.

The pond is about an acre in size, and across it is a post and rail, which is almost quite covered by the water. Some people heard a noise in the water, and imagining something had tumbled in, ran to see what was the matter; when, to their surprize, they saw the water

water open in the middle, so as that they could see the post and rail a good way down, almost to the bottom, and the water dashing up over a bank about two feet high, and perpendicular to the pond. This it did several times, making a great noise. They did not feel the least motion upon the shore, nor was there any wind, but a dead calm. This happened yesterday fortnight, being Saturday the first of November. I suppose we may hear more accounts; and perhaps the same thing happened here, though unobserved.

L E T T E R VIII.

*From Mr. Henry Mills to Thomas Birch, D. D.
Secret. R. S.*

SIR, Rotherhithe, Dec. 15, 1755.

Read Jan. 8,
1756.

AS I am informed, that an account of what I observed in the Thames, Nov. 1. would not be unacceptable to you, the fact was briefly this. Being in one of my barges, unloading some timber, between eleven and twelve a clock, both myself and servants were surprised by a sudden heaving up of the barge from a swell of the water, not unlike what happens when a ship is launched from any of the builders yards in the neighbourhood. But the state of the tide did not then suit with the launching of ships, and I am since certain, that no ship was launched at that time. After the barge had alternately rose and sunk three or four times with a motion gradually decreasing, the water became quiet again; and I attended no further to an inci-

dent of so short duration, till the reports of the agitation seen in the waters of several ponds brought it again into my memory. Whereupon, consulting my memorandum-book, I found, by the work I was then doing, that the day, on which this happened, was the first of November. I am,

Your most obedient servant,

Henry Mills.

IX.

An Account of the Agitation of the Water in Peerless-Pool, near Old-Street, London. By Thomas Birch, D. D. Secret. R. S.

Read Dec. 18,
1755.

U PON the reports, which I had received from several gentlemen, that the agitation of the waters observed in many parts of England, Scotland, Ireland, Holland, &c. on Saturday November 1, 1755, had been likewise taken notice of in Peerless-Pool, near Old-street road, being curious to have as authentic and circumstantial an account as possible of a fact, which I had not heard to have been remarked in any other part of London, or its suburbs, I went thither on Saturday December 6, 1755, and took down the following particulars relating to it, from the mouth of one of the two waiters there, who were eye-witnesses of it. He being engaged between the hours of ten and eleven in the morning, with his fellow-waiter, in some business near the wall inclosing the ground, which

which contains the fish-pond, and accidentally casting his eye on the water, was surprised to see it greatly moved without the least apparent cause, as the air was intirely calm. This occasioned him to call to his companion to take notice of it, who at first neglected it, till being urged to attend to so extraordinary an appearance, he was equally struck with the sight of it. Large waves rolled slowly to and from the bank near them, at the east end, for some time, and at last left the bed of the pond dry for several feet, and in their reflux overflowed the bank ten or twelve feet, as they did the opposite one, which was evident from the wetness of the ground about it. This motion having continued five or six minutes, the two waiters stept to the cold bath near the fish pond, in order to see what passed there; but no motion was observed in it by them, or by a gentleman who had been in it, and was then dressing himself, and who, upon being told of the agitation in the fish pond, went directly thither, with the waiters, and was a third witness of it. Upon the ceasing of it, all three of them went to the pleasure bath, between which and the fish pond the cold bath is situated; but they found the said pleasure bath then motionless, but to have been agitated in the same manner with the fish pond, the water having left plain marks of its having overflowed the banks, and risen to the bushes on the sides of them. The waiter likewise informed me, that the motion in the fish pond had been observed with great surprize by some persons in a house belonging to Mr. Kemp, the master of Peerless-Pool, situated at a small distance from that pond, and commanding a full view of it.

LETTER X.

An Account of the Agitation of the Water at Rochford in Essex, Nov. 1, 1755, in a Letter from the Reverend Mr. Thomlinson to the Rev. Dr. Sykes, D. D. Dean of Burion. Communicated by Tho. Birch, D. D. Secret. R. S.

Christmas-Day, 1756.

Read March 11, 1756. **I**T will surprise you to hear, that we had some symptoms of an earthquake at this place, on the very same day, and about the same hour, in which the late dreadful convulsion of the earth was in so particular a manner fatal to Portugal. One instance of it was of a pond in a close of Mr. Sly's, adjoining to the church-yard; where the water was observed by Mr. Sly himself, to flow a considerable way up the mouth of the pond, and then returning, to flow up the opposite side, repeating this sort of motion for about a quarter of an hour. What is further remarkable in this case is, that, at the very time of this fluctuation, Mr. Sly had the curiosity to examine the condition of two other ponds, which are but a small distance from the former, and found them both very still and quiet. It may deserve notice, that the motion of the water in Mr. Sly's pond was only from east to west, and from west to east, alternately. Whether the fluctuation in those other ponds, which have been mentioned in the news-papers, was the same, it may be worth while: it will at least be a matter of curiosity to inquire. Mr. Sly's pond is very large, and almost round

round. Its mouth is on the east side. The two neighbouring ponds lie in length from north to south, and are comparatively very narrow in their breadth, from east to west; which may in some measure account for the motion of the water in them, if there was any, being less observable: but I have no reason to suppose there was any, as Mr. Sly could discern none. Mr. Sly, immediately on his return home, informed his family of this very astonishing and unaccountable accident, and had not the least suspicion at that time of there being any earthquake, either here or in any other part of the world.

LETTER XI.

From Mr. Richard Philips. Communicated by Lewis Crusius, D. D. F. R. S.

In Berkshire, near Reading.

SIR,

Strand, Jan. 12, 1756.

Read Jan. 15, 1756. SINCE I had the pleasure of seeing you, I have received letters from Reading relating to the earthquake, &c. which was felt at two places in that neighbourhood, on the same day, and about the same time, that the great catastrophe happened at Lisbon.

At my sister's request, a gentleman of our acquaintance has been so obliging to go himself to Mr. Pauncefort's, where the effects of it were most remarkable, and had the following account from the person, who felt and saw the whole process of this phenomenon. On the first of November last, at about 11 o'clock in the morning, as Mr. Pauncefort's gardener.

gardener was standing by a fish-pond in the garden, he felt a most violent * *trembling of the earth*, directly under his feet, which lasted upwards of fifty seconds: immediately after which he observed, that the water in the pond was in a very unusual motion, and suddenly thrown on the opposite side, leaving that, on which he stood, quite dry for the space of two yards, and continued in that state for two minutes, or thereabouts, when it returned as before, and collecting in or near the middle of the pond, rose about twenty inches above the level of the water on each side, and continued so for two minutes in violent agitation, which the gardener described to be like the boiling of a pot.

Of the other affair, which happened at Captain Clarke's at Caversham in Oxfordshire, a mile distant from Reading, my sister, who has inquired what the effects of it were there, writes, that Captain Clarke was alarmed with a very great noise, as if part of the house had been falling down: upon examination however it did not appear, that the house was at all damaged; but a vine, which grew against it, was broken off, and two dwarf trees (such as are used in espalier hedges), were split by the shock. She could not learn exactly how long it lasted, but as it happened at the same time as that at Mr. Pauncefort's, it is probable it continued as long as the trembling of the earth did there, which was near a mi-

* This is the only account, that mentions any *tremor of the earth* to have accompanied the agitation of the waters in this island: and the next account of the very same matter, does not take the least notice of any.

nute. These, Sir, are the particulars of the account I have received, the truth of which may be depended on; and if the communication answers your expectation, I shall be extremely glad of it. I am,

S I R,

Your most humble servant,

Richard Phillips.

L E T T E R XII.

An Account of the same. Communicated by the Rev. John Blair, LL.D. F. R. S.

Read Dec. 18, 1755. **O**N Saturday, November 1, 1755, at Earley-Court, near Reading in Berkshire, in a small fish-pond near the house of Edward Pauncefort Esq; the water was observed about eleven a clock in the forenoon to be in a strong agitation, like that of the tide coming in. The first motion of the water was from the south end of the pond to the north end, leaving the ground or bottom of the fish-pond on the south end altogether without water, for the space of six feet. It then returned, and flowed at the south end, so as to rise three feet up the banks, and immediately went back again to the north, where it likewise flowed three feet up the banks; and in the time betwixt the flux and reflux, the water swelled up in the middle of the pond like a ridge, or rising part of land. This motion or agitation of the water, from south to north, and from north to south alternately, backwards and forwards,

forwards, lasted about the space of four minutes of time ; and there seemed to be little or no motion in the direction of east and west, the weather being perfectly calm during the whole time.

L E T T E R XIII.

In Oxfordshire, at Shirburn-Castle, the Seat of the Earl of Macclesfield, Pres. R. S. as appears by the following Account, communicated by his Son the Lord Viscount Parker, F. R. S. then upon the Spot.

Read Nov. 20.
1755. **O**N Saturday November 1, a little after ten o'clock in the forenoon, walking in the garden at Shirburn-Castle, in Oxfordshire, I perceived the gardener, who was coming towards me by the end of the moat, on a sudden stop short, and look earnestly into the water. As I found by his intentness, that he saw something extraordinary, I went towards him, and perceived immediately a very strange motion in the water. There was a pretty thick fog, not a breath of air, and the surface of the water all over the moat was as smooth as a looking-glass ; notwithstanding which, in that corner of the moat near which I stood, the water flowed into the shore, and retired again successively, in a surprising manner. How long it had done so before I came, or in what manner it began to move, I cannot tell. The flux and reflux, when I saw it, were quite regular. Every flood began gently ; its velocity increased by degrees, till at last, with great impetuosity, it rushed in till it had reached its full height, at which it remained for a little while, and then

then again retired, at first gently ebbing, at last sinking away with such quickness, that it left a considerable quantity of water entangled amongst the pebbles, laid to defend the bank, which run thence in little streams over the shore, now deserted by the water, which at other times always covers it. As the slope of the sides of the moat is very gentle, the space left by the water at its reflux was considerable, though the difference between the highest flood and lowest ebb of these little tides, if I may be allowed the expression, was but about four inches and an half perpendicular height; the whole body of water seeming to be violently thrown against the bank, and then retiring again, while the surface of the whole moat all the time continued quite smooth, without even the least wrinkle of a wave. The time it took up in one flux and reflux, as I did not then observe it, I cannot pretend to guess at. There happened to lie at the bottom of the water, about four feet deep, as I believe, several pieces of white paper; and I could perceive them move backward and forwards, keeping pace with some weeds, and other things, which floated on the top of the water backward and forward, as it ebb'd and flow'd. Being desirous to know, whether the motion was universal over the moat, I sent a person to the other corner of it, at the same end that I stood, and about 25 yards from me, to examine whether the water moved there or not. He could perceive no motion there, or hardly any; but another, who went to the north-east corner of the moat, diagonally opposite to me, found it as considerable as where I was. As I imagined, that, in all probability, the water at the corner diagonally

opposite to that where I stood, would sink, as that by me rose, I ordered him to signify to me, by calling out, when the water by him began to sink, and when to rise. This he did, but to my great surprize I found, that, immediately after the water began to rise at my end, I heard his voice calling to me, that it began to rise with him ; and in the same manner I heard, that it was sinking at his end, soon after I perceived that it began to sink by me. He might stand about ninety or a hundred yards from me. I sent a person to a pond just below where I stood, who called to me in the same manner. The water rose and fell in that pond ; but though he stood at the south-west corner of that pond, as I did at the south-west corner of the moat, it did not rise and fall by him in that pond, at the same time as it rose and fell by me in the moat, but sunk sometimes when the moat rose, and rose when the moat sunk, as it seemed by his calling to me, the rising and falling seeming to be quicker than in the moat, though but little : he might stand about forty yards from me. I sent persons to three other ponds, in all which the agitation was very considerable. The swells, that succeeded one another, were not equal, nor did they increase or diminish gradually ; for sometimes, after a very great swell, the next two or three would be small, and then again would come a very large one, followed by one or two more as large, and then less again. As I did not know when the water first began to move, I did not think it worth while to observe when it should be quiet again ; but having stood by the moat a good while, I went away, and returning again in about half an hour's time, found it perfectly still.

LETTER XIV.

From John Huxham, M. D. F. R. S. to Mr. William Watson, F. R. S.

In Devonshire and Cornwall ; at Plymouth, Mounts-Bay, Penzance, &c.

Dear Sir,

Read Nov. 27, 1755. **F**ROM the 26th of October to the end, the wind was constantly between the north and east, commonly north-east, the barometer 30. 3. thermometer about 50. The north-east wind, and high station of the mercury, continued till the 2d of November; then the wind became west south-west, and the barometer fell somewhat. During all this time the atmosphere was uncommonly thick, and often foggy, but without rain.

Saturday, November 1, about 4 p. m. we had (just about high water) an extraordinary boar, as the sailors call it. The sea seemed disturbed about 20 minutes before, tho' there was very little wind that day, or for some days before. The sky seemed that day very cloudy, in the morning very full of little fiery red clouds, in the afternoon very louring, and in many places of a very odd copper-colour; the atmosphere excessively thick and dark; insomuch that coming down the northern hill towards Plymouth, one of my servants, who is not very curious, took notice of it to me, and desired I would guard against a storm, as he thought near at hand; but not a drop of rain fell.

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When

When I came home, one of our surgeons, who had then just crossed the ferry at Creston, a mile to the south-east of Plymouth, told me, that the tide had made a very extraordinary out (or recess) almost immediately after high water (about 4 p. m.) left both the passage-boats, with some horses, and several persons, at once quite dry in the mud, though the minute or two before, in four or five feet water: in less than eight minutes the tide returned with the utmost rapidity, and floated both the boats again, so that they had near six feet water. The sea sunk and swelled, though in a much less degree, for near half an hour longer. I was told, that at the next morning's tide there were several very large surges.

This boar drove several ships from their moorings, and broke some of the hawsers, and twirled the ships and vessels round in a very odd manner. At Crunill-passage, over another arm of the sea, about two miles west of Plymouth, the same phenomena were observed; and in Stone-house lake, that communicates with that arm of the sea, the boar came in with such impetuosity, that it drove every thing before it, tearing up the mud, sand, and banks, in a very shocking manner, and broke a large cable, by which the foot passage-boat is drawn from side to side of the lake.

These are the most remarkable appearances we had here, which, I confess, did not much surprise me, as I had formerly noted phenomena of this nature more than once or twice in this port, and even more considerable; an account of one of which you will find in my first Volume of *Epidemics*. But when I heard, that at Portsmouth, Holland, in Ireland,

land, Germany, &c. the waters were so strongly agitated on the very same day, it roused my attention greatly, though I am quite lost in conjecture of the cause. You will please to observe, that it happened not here till about 4 p. m. at Portsmouth about 11 a. m. in Holland about 11 a. m. at Kinsale, &c. in Ireland not till 3 or 4 p. m.

L E T T E R XV.

From the Rev. William Borlase, A. M. F. R. S. to the Rev. Charles Lyttleton, LL.D. Dean of Exeter.

Reverend Sir,

Read Dec. 18, 1755. **O**N Saturday the first of last month [November] happened in Mount's-bay, and the parts adjacent, the most uncommon and violent agitation of the sea ever remembered. At that time, and for six days before, the weather had been remarkably calm, the barometer higher than I have ever noted it for three years last past, and in all those days Farenheit's thermometer varied only from 51 to 54; which is moderately high with us in Cornwall, where I have not found it to exceed 64 in the hottest months this year, seldom 60.

A little after two o'clock in the afternoon, the weather fair and calm, barometer at the highest, thermometer at 54, the little wind there was being at north-east, about half an hour after ebb, the sea was observed at the Mount-pier to advance suddenly from the eastward. It continued to swell and rise for the space of ten minutes; it then began to retire, running to the west, and south-west, with a rapidity

rapidity equal to that of a mill-stream descending to an undershot-wheel ; it ran so for about ten minutes, till the water was six feet lower than when it began to retire. The sea then began to return, and in ten minutes it was at the before-mentioned extraordinary height ; in ten minutes more it was sunk as before, and so it continued alternately to rise and fall between five and six feet, in the same space of time. The first and second fluxes and refluxes were not so violent at the Mount-pier as the third and fourth, when the sea was rapid beyond expression, and the alterations continued in their full fury for two hours : they then grew fainter gradually, and the whole commotion ceased about low water, five hours and an half after it began.

Penzance pier lies three miles west of the Mount, and the reflux was first observed here 45 minutes after two : the influx came on from the south-east, and south-south-east : from whence I gather, that the force, from which this agitation proceeded, lay at south nearly, or south-west of this bay, and the sea reaching first the eastern lands (which project a great deal more than those of the west), was thence reflected, and came upon the Mount in an easterly direction : but farther on to the west this eastern current had lost its strength, and the sea came into Penzance from the south-south-east more directly from the point of its momentum. Here the greatest rise was eight feet, and the greatest violence of the agitation about three o'clock.

Newlyn pier lies a mile west of Penzance. Here the flux was observed first, as at the Mount, and came in from the southward (the eastern current being

ing quite spent), nearly at the same time as at the Mount and Penzance, but in a manner somewhat different ; it came on like a surge, or high crested wave, with a surprising noise. The first agitations were as violent as any ; and after a few advances and retreats at their greatest violence, in the same space of time as at the Mount, the sea grew gradually quiet, after it had rose, to the infinite amazement of the spectators, ten feet perpendicular at least. This is near five feet more than at the Mount pier, and two feet more than at Penzance ; and I attribute it to the angle or creek, in which Newlyn lies, wherein the waters were resisted and accumulated by the straitness of the shores, and the bent of the western land ; whereas at Penzance the waters were less confined, and consequently could not rise so high ; but at the Mount (at that time an island) the sea had full room to spread and disperse itself, and there rose least of all.

The agitations of the sea at Moushole (another pier in this bay) did not materially differ from those at Newlyn.

You may imagine, Sir, that as soon as this extraordinary commotion of the water was observed in a bay so full of people, and in all parts of it so interested (and particularly now the pilchard-fishery is in hand), in what passes upon the sea, all hands were busy in endeavouring to preserve their ships, boats, and craft. At the Mount the fishermen got to their boats, then riding off the pier, concluding that a violent storm was at hand : they were no sooner on board, than their boats were heav'd in with the surge ; but they were no sooner in the pier, and struggling

struggling to secure themselves and boats, as much as their astonishment would permit, than their boats were hurried back again through the gap or mouth of the pier with incredible velocity: when they had gone off as far as the reflux determined, they were carried in, and out again, with an impetuosity, which no ropes could withstand, and would have destroyed both men and boats immediately, if in their passage they had touched the least stone of the pier. As you know the place, Sir, you will easily recollect, that what preserved them was not the rudder, or the oar, but the same stream and current, which put them in danger; for it had neither in or out-let but thro' that narrow gap, and therefore set directly in, and out. At Penzance there was no damage, nor, what is more extraordinary, at Newlyn, where their boats are much more numerous. What preserved them all (under Providence) was, that this rage of the water happened a little after noon, when the men were all at leisure to attend their boats: if it had come on upon them in the night, it is thought not one boat out of fifty would have been saved, and consequently many lives lost.

In Guauas lake, the Happy ketch of war veer'd round upon her anchors, keeping her head by turns to the flux and reflux, and in the decline of the commotion hove the log to estimate the velocity of the water, and found it to run at the rate of seven miles in an hour. No motion of the land was any-where perceived, as far as I can learn.

I have no account of this agitation yet from Scilly, but it was perceived at the Land's end; and in the north chanel, at the pier of St. Ives, it rose betwixt

eight and nine feet, and floated two vessels before quite dry, but all smooth; no sea broke.

In the little harbour of Heyle, about four miles north of the Mount on the Severn sea, the agitation did not make its appearance till an hour and a little more after the ebb began, which must be full an hour later than with us, and is easily accounted for by the circuit of land at the extremity of this county, which the swell must have made before it could reach into the north chanel to St. Ives and Heyle. In this inland half-tide harbour it continued visible but an hour and half; the greatest flux was about the middle of that time, the surge being at that time seven feet high; but in general it rose and fell but two feet only, owing, as I suppose; to the force and quantity of water being broke in its advances into so retired a creek.

At Swansea, in Wales, further up in St. George's chanel, where their ebb is later still than in Heyle, I find the agitation was proportionably later than with us, and was not observed till after two hours ebb, near three quarters after six.

At Kingsale, in Ireland, more indeed to the north of us, but more open to the Atlantic ocean than Swansea, and farther to the west, the agitation reach'd not a full hour after us, but above two hours sooner than at Swansea, all tending to shew, that the force came from the south and south-west.

What relation these little palpitations or tremulous rebounds of the sea (for, in our parts, we may thank God they were no more) had to the dreadful convulsions on the coasts of Spain and Portugal, whether they were the fainter parts of that deplorable

shock at Lisbon, or the expiring efforts of some similar subterraneous strugglings of nature farther to the west, under the Atlantic ocean, will remain uncertain till more facts and dates appear; but, by the accounts from abroad, this first of November seems to have been a day of univerfal tremor to all the sea-coasts of the western parts of Europe.

I would not be thought to suggest, Sir, that a shock so far off as the coast of Spain could be so immense, as to propagate a motion of the water quite home to our shores. I should rather imagine, that there were several shocks, and some much nearer to us, but all perhaps from one and the same cause diffused in different portions, and permeating more contracted or dilated, but still communicating passages: I should imagine, that this cause affected the seas and land, in proportion to its own force, and the superior or weaker resistance of the incumbent pressure; that where it found the least resistance of all, there it found its vent, and the swell its cure.

But these disputable points I submit with great deference to the learned, who live in the center of intelligence, as well as of mutual information, from one another, and remain,

S I R,

Ludgvan,
Dec. 4, 1755.

Your most obedient and

affectionate humble servant,

Wm. Borlase.

Extract

Extract of L E T T E R XVI.

From Swansey, dated Decem. 8, 1755. Communicated by the Rev. John Blair, LL.D. F. R. S.

Read Jan. 8,

1756.

ON the first of November, about two hours ebb of the tide, and between six and seven a clock in the evening, at a place called White-rock, about a mile up this river, where great numbers of ships load coal, and discharge copperore, for the use of the works erected at that place, a great head of water rushed up with a great noise, floated two large vessels, the least above two hundred tons (one whereof was almost dry before), broke their moorings, and hove them across the river, and had like to overset them, by throwing them on the banks. The whole did not last ten minutes, the rise and fall; and, what is most remarkable, it was not felt in any other part of the river; so that it must have gushed out of the earth at that place; for near the town and mouth of the river there is a passage-boat, that was passing at that time, and had been for the whole day, it being our market-day, when that boat is constantly employed, and there nothing was felt of it. This is the best account I can get, and what is said to be matter of fact.

Extract of LETTER XVII.

From Mr. William Arderon, F. R. S. to Mr. Henry Baker, F. R. S.

Norwich, January 8, 1756.

Read Jan. 15, 1755. In answer to your inquiry, whether any agitations of the water had been observed in this county on the first of November, give me leave to inform you, that two gentlemen and a servant went out a shooting on the sea-shore, from Sir Thomas L'Estrange's, at Hunston, on the first day of November, and were in great danger of being drowned, by the sea's sudden flowing before its usual time, and saved themselves, with difficulty, by clambering up the sides of the cliffs.

LETTER XVIII.

To Mr. William Arderon, F. R. S. from Mr. Thomas Barber in Yarmouth, concerning the Earthquake on November the first. Communicated by Mr. Arderon.

Mr. Arderon, January 26, 1756.

Read Feb. 19, 1756. Received yours of the third ultimi, and, after the best inquiry I can make of occurrences here, at the time, that Lisbon was destroyed, can inform you of the following particulars related to me.

John Ives, master of a ship in the London trade, being on board his ship, a little before noon, the first of November (his ship was then in Yarmouth haven,

haven, at the ballast-quay, where the caulkers were repairing her), observed the ship had an uncommon motion, and that the water was violently agitated, and no wind at that time stirring to occasion it. The agitation was so great, that the caulkers left off work some time; and they remarked, that the water suddenly flowed six feet, sloping on the side of the haven.

The uncommon motion of the ships in Yarmouth haven, at that time, by the agitation of the water, was taken notice of by Mr. Gooch, a block-maker, and his man, at work in his shop, fronting the quay; as also by Thomas Aldered, master of a Yarmouth ship, who was then walking on the quay, and by many others.

William Dawson, master of a Yarmouth ship, then going to Gainsborough in Lincolnshire, was inform'd, on her arrival, that the water rose five or six feet, and fell again in a minute or two, both there and at Hull, at that time.

These are the most material circumstances I can inform you of relating to this affair.

L E T T E R XIX.

From the Reverend Mr. John Harrison, Rector of Hawkeshead in Cumberland, to the Right Reverend Dr. Edmund Keene, Lord Bishop of Chester.

My Lord,

Read Jan. 15, 1756. **T**HE last post brought me a letter

from Mr. Lambert of Lancaster, intimating your lordship's more particular inquiry
8 into

into the phænomenon, which happened here the 1st of November last. Some time soon after, I was called to give baptism to a weak child at a house bordering on Windermere-water, about three miles from the head or north end of the lake, and there fell in with four boats, two men to each boat, employed in drawing with nets for chars. I consulted the fishermen, and was told, that but one of their boats was in use the day the waters were disturbed, and that, at the time of such agitation, the boat was drawn up aground, and one of the men on shore, and the other fitting in the boat, the lake quite still and smooth as glas, and not a breath of wind, when on a sudden the water swelled, floated the boat, heaved it up about its length farther upon land, and took it back again in the falling back of the wave; otherwise it would have been left quite dry. I asked, what depth of water the boat takes? and was answered, scarce half a yard. How long the flux and reflux continued? About eight or ten minutes, continually decreasing. What time of the day? About ten in the forenoon, but that, having no watch, they could not be exact. Did the man on land feel no trembling under him, or did they hear any noise? No. I have also inquired of some ferry-men, busy at the time on shore, about the middle part, *i. e.* about five miles from each end of the lake, who gave me the like account in every particular, only that their boat was moor'd, and could not be driven on shore. I asked them, that supposing one had stood at the water's edge while it was still, how deep, they imagined, the swell would have taken him? and was answered, they thought, up to the knees.

Mr.

Mr. Sandys, of Graythwaite, tells me, that his husbandman, and one of his farmers, were that forenoon at work in a field, within sight of the lake, about two miles and a half from the foot or south end of it, and, on their return home, told him, that about ten a clock they heard a noise from towards the water like, as they could imagine, the sound of the slate off the whole side of any large building, sliding down the roof at once ; that they expected it to be some strong gust of wind coming at a distance, but as they could not afterwards see a twig stir, they were at a loss to conjecture whence it proceeded ; that the water was quite still before and smooth, but on that noise they observed a narrow rippling (to use their own word), from the point of a rock, not far from them, across the lake, but were not nigh enough to observe any other agitation. I have also consulted a ferryman belonging to Thirston-water, commonly called Conistone-water, a lake about five miles in length. He says he was standing, at the time mentioned, at their landing-place, and was surprised to see the water flow up the bank when there was not the least wind, and the water quite calm. I asked, how high it flow'd ? He said, about a yard up the bank, and continued its motion back and forward about five minutes, as near as he could guess, for that he did not look at his watch at the time. How much he computed the perpendicular swell ? He thought about a foot ; which, as I know the place, I think is pretty near the truth, answerable to a yard-flow up the bank. I am told also, from a person of credit, that the like agitation, though in a less degree, and shorter continuance, was observed

at the time on Easthwaite-water, a lake about a mile and half in length, lying near this town.

In all my inquiry, my Lord, I cannot find, that any motion or tremor of the ground was perceived by any one. And as to the differences of the time the agitations lasted, may they not be thought proportionate to the different dimensions of the lakes, as the vibrations of pendulums, after the impelling powers are taken away, may be found to continue in proportion to their lengths. Upon the whole, tho' the several agitations above-mentioned are undoubtedly matters of fact, yet had there, at the time they happened, been a strong wind, the phænomenon would perhaps have been lost among the common waves; and as no motion or tremor of the ground was perceived, does it not seem hard to account for this motion of the waters from a subterranean cause? Or may it not rather be deemed owing to some sudden alteration in the pressure of the atmosphere? But I shall tire your Lordship, and beg pardon, who am,

My Lord,

Hawkeshead,
Dec. 24, 1755.

Your Lordship's most dutiful and

most obedient humble servant,

John Harrison.

Extract of LETTER XX.

*From the Honourable and Rev. Dr. Spencer Cowper,
Dean of Durham, to his Brother the Right Honourable William Earl Cowper, F. R. S.*

Durham, near the City.

Read Jan. 15, 1756. **U**PON acquainting Mr. Gowland with Lord Willoughby's desire of being acquainted with the circumstances of the commotion of the water in his pond *, on the first of November last, he came to me the other evening with his gardener, who gave the following account:

That on the first of November, about half an hour after ten in the forenoon, as he was working in his master's garden, he was alarmed by a sudden rushing noise, like the fall of water: That imagining the head of the pond to be broken down, which was at a small distance from him, he ran hastily towards it, and finding it firm and intire, was a good deal at a loss to account for the noise he had heard; when, casting his eye upon the water, he saw it gradually rise up, without any fluctuating motion, till it reached a grate, which stood some inches higher than the common water-level, through which it discharged itself for a few seconds: That it then subsided as much below the mark it rose from, as it was above it in its greatest elevation; and continued thus rising and falling all the time he stood by it, which was, he reckons, about six or seven minutes, making four or five returns in about one. At last

* At Mr. Gowland's seat, five miles from Durham.

he grew so alarmed, that he ran to the house to call his fellow-servants down to look at it; but though the water then continued to have some commotion, it was nothing considerable. Mr. Gowland very much regrets not being made acquainted with it at the same time; but he having company in his house that day, the servants did not mention this extraordinary appearance to him till the day following, when he went down to the pond, but found all quiet. The gardener did not observe the least shaking of the ground; but in regard to the noise, he said, it was much greater than could proceed from the running of the water through so small a grate, nor did he observe it at any of the discharges he saw the water make through it. The pond stands to the west from the house, and is about forty yards long, and ten broad. The ebb and flow were each about half a foot in the perpendicular. This is all the account the man gave; which, though very extraordinary, agrees so nearly with most others given of this commotion in different parts of Europe, that the truth of it need not be doubted, particularly as Mr. Gowland was apprised of this appearance the day following, many days before the others, which confirm it, was known in England.

A remarkable high tide was observed near Hartlepool, on the fifth of November. At a place called Saltholm it rose upwards of a yard higher than ever known in the greatest spring-tides, and did some damage. The time was, as well as I can recollect, eleven at night. I cannot hear, that the earthquake was felt at all in this county.

LETTER XXI.

To Dr. John Stevenson, Physician at Edinburgh.
Communicated by Dr. John Pringle, F. R. S.

Scotland, at Loch Ness.

Dear Sir,

Read Jan. 8, 1756. I Have your favour of the 20th, and in compliance with your request, I give you the following reply to your queries.

I arrived at Fort-Augustus, from Fort-William, on the 31st of October last: next morning about ten I walk'd abroad, when the barrack-master, and several others, came and acquainted me, that they had seen a very extraordinary agitation of the waters at Loch Nefs. I refused giving credit to their story, and a little afterward returned to the fort.

About 11, my clerk and the brewer at that place came and acquainted me, that a more extraordinary agitation than the former had happened, and they apprehended some danger to our brewery, which is situated where the river Oich discharges itself into the lake. I walked then to that place, but before my arrival the water had returned to its usual channel. I saw very clearly the marks on the banks, to which it had flowed; the banks were quite wet, and a strip of leaves of trees and twigs, &c. left on them. I inquired then into this affair, and the account the spectators gave were, that they observed the river Oich, which runs from west into the head of the lake, swell very much, and flow up the river from the lake, with a pretty high wave, about two or three feet higher than the ordinary sur-

D d d z face,

face, with a pretty quick motion against the wind, and a rapid stream, about two hundred yards up the river; then broke on a shallow, and flowed about three or four feet on the banks on the north side of the river, and returned again gently to the lake. That it continued ebbing and flowing in that manner for about an hour, without any waves so remarkable as the first, till about 11 o'clock, when a wave higher than any of the rest came up the river, and, to the great surprize of all the spectators, broke with so much force on the low ground, on the north side of the river, as to run upon the grass upwards of thirty feet from the river's bank.

Lieut. Smith, of the artillery, Mr. Gwyn, son of Captain Gwyn, of the Loch Ness galley, Mr. Lumisden, barrack-master at Fort-Augustus, Mr. Forbes, barrack - master of Bernera, Thomas Robertson, brewer at Fort-Augustus, and George Bayne, my clerk, and several others, were the spectators of this extraordinary phænomenon: some of them saw the whole progress of it, others only a part.

Loch Ness is about twenty miles in length, and from one to one and a half mile broad; bears from south-west to north-east. There was no extraordinary muddiness observed in the water, though it did not appear quite so clear as usual. The morning was cold and gloomy, and a pretty brisk gale of wind blowed from west south-west. The river Oich lies on the north side of the fort, and on the south side runs the river Tarff from west south-west, discharging itself also into the head of the lake; and which was observed to be agitated at the same time and manner as the other. But there were no shakings

or tremors felt upon the land. I have heard of the same agitations in Loch Lommond. It is probable all the other lakes in the highlands were also agitated, and it is my opinion they were, though I have not heard of many particulars. I always am, with greatest regard,

My dear Doctor,

Edinburgh,
Dec. 22, 1745.

Your very affectionate

humble servant,

Robert Gardener.

P. S. Loch Ness is vastly deep, its soundings in many places being from 100 to 135 fathom, which is greatly below the level of the sea at Inverness. Its sides are most part rocky, and it deepens immediately from them. About three musket-shot from the river Oich it measures about 120 fathom in depth.

Extract of L E T T E R XXII.

From Sir James Colquhoun, of Luss, to Mr. Fletcher, Member of Parliament, dated Rosedoe, Dec. 8, 1755. Communicated by Dr. Pringle, F. R. S.

At Loch Lommond.

S I R,

Read Jan. 22, 1756. **Y**OUR favour of the 29 ult. I received by last post, desiring me to transmit you an exact account of our Loch Lommond earthquake. You must know, that I was confined to the house with a sore throat, which probably

bly prevented my seeing that strange phænomenon: but the best account I have got of it is from Angus M'Diarmid, inn-keeper at Tarbat, who was an eye-witness, and was with his watch in his hand all the time of the agitation; and his account is as follows:

On the first day of November last, Loch Lomond all of a sudden, and without the least gust of wind, rose against its banks with great rapidity, but immediately retired, and in five minutes time subsided, till it was as low in appearance as any body then present had ever seen it in the time of the greatest summer drought; and then it instantly returned toward the shore, and in five minutes time rose again as high as it was before. The agitation continued at this rate from half an hour past nine in the forenoon till fifteen minutes after ten, taking five minutes to rise, and as many to subside; and from fifteen minutes after ten, till eleven, every rise came somewhat short in height of the one immediately preceding, taking five minutes to flow, and five to ebb, until the water settled as it was before the agitation. Angus M'Diarmid measured the height, to which the loch rose, and found it to be two feet four inches perpendicular. Loch Long and Loch Ketterin were also agitated on the same day, and about the same time; but the phænomenon was not so minutely observed as that any exact account can be got of it.

It appears, by communications sent from abroad, that the like agitations of the water were observed at the Hague, Leyden, Harlem, Amsterdam, Utrecht, Gouda, and Rotterdam, and also also at Bois-le-Duc'; about eleven of the clock on the 1st of November; and likewise at

at Kingsale in Ireland, as appears from the following letter.

LETTER XXIII.

From L. Nicola to James Simon, Esq; F. R. S.

SIR,

Read Jan. 22, 1756. AS I have been desired to write an account of the extraordinary agitations of the sea here, on the fatal first of November, which may possibly be acceptable to the Royal Society, I have taken the liberty of directing it to you as a member of that Society, to transmit or suppress, as you may think proper.

On the first of November, between the hours of two and three afternoon, the weather being very calm, and tide near full, a large body of water suddenly poured into this harbour, with such rapidity that it broke the cables of two sloops, each moor'd with two anchors, and of several boats lying between Scilly and the town, which were carried up, then down, the harbour, with a velocity far exceeding what I ever saw by a ship or boat, though favoured with all the advantageous circumstances of tide and wind, in any degree of violence. By the direction, in which the sloops were carried down, I imagined they and several boats would have ran foul of each other, and also of the King's (or revenue) boat, which lay at her moorings: but just at the time I thought this unavoidable, an eddy whirled them round several times, and hurried them up again with the same rapidity. This was repeated several times;

times; and while the current rushed up at one side of the harbour, it poured down with equal violence at the other. A vessel, that lay all this time in the pool, did not seem to be any ways affected; nor was the violence of the currents much perceived in the deeper parts of the harbour, but raged with most violence on the flats. The bottom of the harbour, which is all a slab, was much altered, the mud being washed from some places, and deposited in others. The Reverend Mr. Keef says, the perpendicular rise of the water at his quay was five feet and a half, as he measured it, and I am told it was much higher at the market-quay, which it overflowed, and poured into the market-place, as a gentleman who was present assures me; and also says, that it came with such rapidity, that some men, who were on the quay immediately, on the first rise of the water, ran off, but could not do it with expedition enough to prevent their being overtaken, and up to the knees. The agitations of the water were communicated some miles up the river, but, as in the harbour, were mostly perceptible in the shallowest places. The successive risings and fallings of the water continued about ten minutes, as nearly as I could judge, not having particularly attended to this circumstance, and then the tide returned to its natural course. Between six and seven in the evening I saw the water rise again, tho' not with as great violence as the former time; and I am told it continued its alternate ebbs and flows till three in the morning. By different accounts received here the water was affected in the same manner along the coast, to the westward of this harbour, and it is reported, that, about nine o'clock

o'clock in the morning a shock of an earthquake was felt at Cork; but I have not met any persons of credit who pretend to say they felt it.

I am informed that, in the year 1750, something of this nature happened here. The water suddenly flowed out of the river, which is of a very considerable depth near a mile up (See PLATE XI.), with such rapidity as to leave its chanel almost dry, and raise the water in the harbour so suddenly, that several boats were drove from their anchors, and cast on shore. This, attended with violent thunder and lightning, continued scarcely a minute, when the water returned to its natural situation.

These are all the particulars I was a witness to, or could collect from good authority. I am,

S I R,

Kingsale.
Dec. 7, 1755.

Your most humble

and obedient servant,

L. Nicola.

LETTER XXIV.

Communicated by Richard Brocklesby, M. D. F. R. S.

S I R,

Read Nov. 27, 1755. **M**Y letter from Kingsale runs thus:

“ There was a violent shock of an earthquake felt yesterday at Cork, and at the

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“ same moment of time we had a most surprising
 “ thing happened here: it was then ebbing, and
 “ near low water, when on a sudden the flood re-
 “ turned so violently, and in such quantities, that
 “ the market-quay was covered, and the tide flowed
 “ quite up to the market, at the same time not a
 “ breath of wind stirring; all the vessels in the har-
 “ bour of every kind were forced from their anchors,
 “ and hurried away by the rapidity of the flood; and
 “ as the ebb was as sudden, and equally violent, se-
 “ veral of the vessels were left dry on shore.”

N. B. The water must have rose considerably above
 its utmost height at even equinoctial tides, to flow
 up to the market. This letter was dated Nov. 2.
 and wrote by a person of great veracity. I am,

S I R,

Nov. 19, 1755.

Your most obedient servant,

Hen. Tom.

L E T-

LETTER XXV.

An Account of an extraordinary Alteration in the Baths of Toplitz in Bohemia, on the first of November 1755, in a Letter from Father Joseph Steplin to James Short, M.A. F.R.S. Translated from the Latin.

SIR,

Prague, January 30, 1756.

Read Feb. 26,

1756.

A Report being brought hither, that at Toplitz, a village famous for its baths, and nine Bohemian miles north-west from Prague, the source of these baths had undergone some change; in order to know the truth of this, I requested the president of the Supreme Royal Council to send me an exact account of it, in answer to the several questions, which I proposed to him. By this means I have procured the following relation of that fact: That in the year 762 those baths were discovered; from which time the principal spring of them had constantly thrown out the hot waters in the same quantity, and of the same quality. On the first of November of the last year 1755, between eleven and twelve in the morning, the chief spring cast up forth such a quantity of water, that in the space of half an hour all the baths ran over. About half an hour before this vast increase of the water the spring grew turbid, and flowed muddy; and, having stopped intirely near a minute, broke forth again with prodigious violence, driving before it a considerable quantity of a reddish oker, *Crocus Mar-tialis*. After which it became clear, and flow'd as

E e e 2

pure

pure as before; and continues still to do so; but it supplies more water than usual, and that hotter, and more impregnated with its medicinal quality.

You see, Sir, that the alteration made in this spring happened almost at the very time when Portugal began to be shook with the earthquake. Not doubting therefore, that accounts from various parts concerning the effects of so extensive an earthquake will be sent to the Royal Society, I presum'd, that this would not prove unacceptable to them. I am,

S I R,

Your most humble servant,

J. Steplin.

Extract of L E T T E R XXVI.

From Mr. De Hondt, of the Hague, concerning the Agitation of the Waters, Novem. 1. 1755. Translated from the French, and communicated by Tho. Birch, D. D. Secret. R. S.

Hague, Nov. 7, 1755.

Read Nov. 20, 1755. **W**E had, on Saturday morning last, at eleven o'clock, a phænomenon, which astonish'd every body. In absolutely calm weather there was observed of a sudden so violent a motion in the water, that the ships were struck against each other, and broke the cables, which fasten'd them. It was felt at the same time at the Hague, Leyden, Harlem, Amsterdam, Gouda, Utrecht, Rotterdam, and Boisleduc. At the Hague it was but

but slight; and no motion was felt in the ground. You will see a more circumstantial account of it in the Dutch Gazette of this week.

Extract of L E T T E R XXVII.

From Mons. Allamond, Professor of Philosophy at Leyden, and F. R. S. dated there Decem. 9, 1755, to Mr. Trembley, F. R. S. Translated from the French.

Read Dec. 18,
1755. **A**LL that I have been able to collect, that is certain, with relation to what was observed here concerning the earthquake of the first of November, amounts to but very little. Between half an hour after ten and eleven in the morning, in some of the canals of this city, the water rose suddenly on the quay, situated on the south. It returned afterwards to its bed, and made several very sensible undulations, so that the boats were strongly agitated. No-body could inform me to what height the waters rose, except a miller, who lives between Delft and the Hague. Having observed this singular motion of the water in a canal, he ran home for a pole, which he plunged into the water, and saw it rise up the pole at least a foot high, though the air was extremely calm.

The same kind of motion was perceived here in the tuns of water of two brewhouses, and in those of three brewhouses at Harlem. The branches of the Roman catholic church of Rotterdam, which hung from long iron rods, made several oscillations. A tallow-chandler at the Hague was surprised to hear

hear the clashing noise made by all the candles hung up in his shop.

This is all that I have any certain information of, and it shews, that our country had some share in the general agitation. Many other things are reported, but not sufficiently attested.

The accounts brought from Norway inform us, that the same observations were made there, almost at the same time.

LIX. *An Account of the Earthquake, Novem. 1, 1755, as felt in the Lead Mines in Derbyshire; in a Letter from the Reverend Mr. Bullock to Lewis Crusius, D. D. F. R. S.*

LETTER I.

Rev. Sir, Ashford, near Bakewell, Derbyshire, Mar. 3, 1756.

Read March 11, 1756. **I** Here send you an account of the earthquake, which happened at the lead mines on Eyam-edge in the peak of Derbyshire, on Saturday the 1st of Novem. 1755, about 11 o'clock in the forenoon. I made a strict inquiry at the mines, on the 21st of February last, both for my own and your satisfaction; and can assure you, that the circumstances related may safely be relied upon as matter of fact. If there be any thing in my power, which you would chuse to have explained





