

SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

CCXXVI.]

NOVEMBER, 1884.

[PRICE FOURPENCE,
or 5s. per ann. post free.]

THE THUNDERSTORMS OF 1884.

(Concluded from page 140.)

[NOTE.—The summation of the facts reported for the whole period will be found on pages 155 to 159.]

TUESDAY, AUGUST 12th—(continued.)

LANARK.

Blackwood, Stonehouse.—A horse killed, and another injured.

Braidwood.—A brakesman, employed by the Caledonian Railway Company, struck and stunned.

Broomfield Terrace, Airdrie.—L came down the chimney, forced out the stove, and damaged the furniture.

Carbarns, Wishaw.—A sheep and a cow killed.

Dalmacouter Farm, Airdrie.—Haystack struck and burned.

Glasgow.—A girl named Flora Smith was struck in Regent-street and blinded. The steeple of St. Mark's Free Church was struck, cutting away some stone work and shattering the slates. Three men erecting a stack in Swanston-street, Bridgeton, were struck and rendered insensible. A roof at Clyde-place was partly destroyed, and a roof and tower on houses in John Knox street damaged.

Greenhead Farm, Wishaw.—Hayrick burned.

Halestonemuir, Dalserf.—Two cows killed.

Larkhall.—Two cows killed.

Merryton, Larkhall.—Haystack set on fire.

Overtown, Wishaw.—Horse killed.

Stonehouse.—Three houses struck in Kirk-street.

Sunnyside Railway Station, Coatbridge.—The chimneys and roof were shattered about 11.15 a.m., the station agent's house sustained considerable damage, the L having passed down the chimney.

Wellgatehead, Lanark.—A chimney-top much rent by L, and a number of trees in the neighbourhood shattered.

Yieldshields, Carluke.—Hayrick struck and set on fire.

AYR.

Cambusdoon.—Several sheep were killed under a tree, where a man had also taken shelter.

Chalmerhouses, Irvine.—Hayrick struck and ignited.
Eglington Chemical Works.—Chimney struck.
Galston Railway Station.—A telegraph inspector working at the instrument received a shock which paralysed his arm.
High Grange, Maybole.—Five sheep killed.
Hillhouse, Irvine.—The house of a ploughman was burned.
Kilmarnock.—Part of the coping of the chimney of Messrs. Ferguson's mill was thrown down.
Maybole.—Chimney stack at shoe factory shattered, and the Parish Church spire greatly damaged.
Roadside House, Troon.—L ignited the thatch and the house was burnt to the ground.
Sandhill House, Troon.—L struck and entered the house.
Troon.—A vessel in the harbour had her topmast carried away.
Whitletts, Ayr.—House struck, the grate in one room, and the hearthstone in another, broken.

RENFREW.

Ardgowan Street, Port Glasgow.—About 5 p.m. several men were employed on a steel ship in course of construction at Messrs. Russell and Co's. yard, when six of them were struck down and severely injured. They were all much burned about the face, and from one of them the whole inside skin of the mouth was peeled off, another had a mark left on his back as large as a man's hand, and resembling the trunk and branches of a tree.

Auchenlôdmont, Paisley.—Stack of hay burnt.
Greenhead Farm, Houston.—Chimney struck and damaged.
Johnstone Foundry, Paisley.—Part of a chimney knocked down.
Neilston Colliery.—A man ascending the shaft was struck and considerably injured.

DUMBARTON.

Warriston, Helensburgh.—W. Hutchison while working in the vinery was struck by L and rendered insensible for half-an-hour.

STIRLING.

Banton, Kilsyth.—A horse was struck and nearly cut in two, and a large block of buildings was rent from top to bottom.
Curriemyre Farm, Kilsyth.—A cow was killed.
Gartness.—A man killed.
Kilsyth.—A large chimney stalk was struck and part of it dislodged. The roof of a house was also much damaged.
Riskend Farm, Kilsyth.—Chimney struck and the grate thrown into the room.
Main Street, Kilsyth.—Chimney stack struck and the masonry dislodged.
Royal Bank, Kilsyth.—Chimney struck, gas pipe fused and gas ignited.
Twecher, Kilsyth.—An engine was struck and the boy attending to it severely injured.

BUTE.

Portrye Farm, Millport.—Cow killed.

ARGYLL.

Inverary.—The L struck the Established Church, but little damage was done.

CLACKMANNAN.

Alloa.—The telegraph instruments at the Post Office and at the North British Railway Station were broken.

Whins, Alloa.—A tree struck.

KINROSS.

Craighead Farm, Fossoway, Kinross.—A tall plane tree was struck, and a bull, three cows, and five calves sheltering under it killed. A cow a few yards distant was temporarily paralyzed.

Dowhill, Cleish.—Four cattle killed.

FIFE.

Auchtermuchty.—L struck the waste store of Messrs. Curr & Co., descended the chimney and ignited the waste, greatly alarming two girls in the store.

Balbegie Woods, Thornton.—A cow killed.

Birns, Ladybank.—Cow killed.

Carnock, Dunfermline.—Chimney rent and ceiling damaged.

Carseknowes, Kettle.—L struck the roof of a stable and killed a horse inside.

Cellardyke.—The steeple of the new Established Church was struck, and a few slates dislodged from the roof. At the Post Office the telegraph instrument was destroyed and some papers were lighted.

Chapel Green, Elie.—Chimney at Carrack House struck and some masonry displaced.

Demperston, Auchtermuchty.—A large poplar tree struck.

Freuchie, Ladybank.—L struck the chimney of a house, passed through a room, melted the gas-pipe and ignited the gas.

Hahill, Collessie.—Three cattle killed in a field.

Jamesfield, Newburgh.—Farmhouse struck and chimney demolished.

Kilmaron, Cupar.—Three cattle killed.

Kimloch, Cupar.—Two cattle killed.

Penitentiary Close, Newburgh.—Part of the chimney stack thrown down, slates stripped off the roof and some ornaments in the rooms damaged.

Pitkeirie, Anstruther.—Hay stack struck and burnt.

Pittencreich, Cupar.—A horse killed.

Rankeilour, Cupar.—Ox killed.

Union Bank, Auchtermuchty.—L struck the chimney, threw down the cans, melted a gas-pipe, and ignited the gas under the top floor.

West Anstruther.—House struck, the chimney being shattered.

PERTH.

Ballunie Farm, Coupar Angus.—Lightning descended the chimney, and smashed a clock.

Bridge of Earn.—At the path of Condie, a man named William Nicol was killed while gathering sheep; the L seems to have struck his head, and passed through his body.

Crieff.—A large tower on a block of buildings in East High-street was struck, and much damaged; and the grate of a dwelling-house in the same neighbourhood was thrown into the middle of the room. A spire, belonging to Messrs. Donaldson, was stripped of slates, and a large oak, believed to be over 500 years old, was shattered.

Doune.—The belfry of the Episcopal Church was struck by L, but very little damage was done.

Maderty, Crieff.—A horse killed, and a haystack burnt.

Perth.—Part of a building in course of alteration collapsed—struck, it is believed, by L—and injured four men.

FORFAR.

Andover Hill, Brechin.—The tower of Smith's Schools damaged.

Baldovie Farm, Kirriemuir.—A calf killed.

Balownie, Stracathro, Brechin.—Chimney struck.

Brechin.—Smart's Factory struck.

Broughty Ferry.—Mr. J. Bremner, residing in Brook-street, was struck by the electric fluid, which is supposed to have travelled into the room by means of a telephone wire. Several persons in the street were struck and stunned, but none seriously injured. A barque lying in the river had the top of her mast shattered. At West Ferry a house was struck, the L descending the chimney, smashed the mantelpiece, and damaged some ornaments; several lamp-posts were knocked down, and two telephone poles damaged. At the Beach two houses were struck, in one the chimney was damaged, in the other the gaspipe melted, and the gas lighted.

Carnoustie.—The wife and family of J. Tosh were in a neighbour's house when it was struck, the woman had her face burned, and a boy was rendered insensible; several other houses were struck and damaged. A guard applying the brake to a goods train at the station received a shock, his arms being paralysed for a few minutes.

Dalhestnie, Edzell.—A horse killed.

Douglas, Bleachfield, Dundee.—Manager's house struck, roof and chimneys damaged, and two grates driven into the rooms.

Fairmuir, Dundee.—L struck the chimney and part of the stack was thrown down.

Forfar.—Two houses struck, but no one injured.

Haugmuir, Brechin.—Three cattle killed.

Kincraig, Brechin.—Bullock killed.

Lochee, Dundee.—A fire ball burst near the bakehouse of Mr. Rollo, a stable near was stripped of slates, a window was broken, and two men in the bakehouse experienced violent shocks.

Loch of Liff, Carnoustie.—Two cattle killed.

Muirhead of Liff, Carnoustie.—Three cattle killed.

Rosewell, Carnoustie.—L entered by the chimney, destroyed a time-

piece and other articles, and so frightened a young woman that she required medical treatment.

Union Street, Arbroath.—Slates dislodged from a house.

West March, Muirhead of Liff.—L struck the kitchen chimney, dislodged a grate, and killed a calf in the byre near at hand.

Whitehills, Forfar.—Two houses struck, a chimney damaged, a coping-stone thrown down, and slates dislodged.

ABERDEEN.

Glenmuick, Ballater.—Coach-house struck, and much of the roof torn off.

Upper Deeside.—Huge balls of fire were seen rolling down the slopes of Lochnagar ; and several farm buildings were struck by L.

IRELAND.

DOWN.

Ballyward, Castlewellan.—Two men struck dead.

Waterask, Dundrum.—Three cows and a horse killed.

Between *Newcastle* and *Annalong* four cows were killed.

MONDAY, SEPT. 1st.

YORK.

Silsden, Skipton.—A farmer was fetching his cattle home, when he was struck by L and killed ; two children with him were uninjured.

TUESDAY, SEPT. 2nd.

GLOUCESTER.

Malswick, Newent.—An oak tree under which a cow was sheltering was struck, and the cow instantly killed.

Oakle Farm, Newent.—Two heifers killed by L.

WEDNESDAY, SEPT. 3rd.

PERTH.

Dalguise Station, Dunkeld.—The station agent, Mr. Geddes, was operating the telegraph instrument, when he received a shock which temporarily paralyzed his arm, side, and leg.

THURSDAY, SEPT. 4th.

ARGYLL.

Lochgair, Lochgilphead.—Shortly after three o'clock the L killed three cows at pasture, and upwards of a score of sheep on the hill.

PERTH.

Fernbank House, New Scone.—About three o'clock L struck the chimney and knocked down the can, and a few minutes afterwards the western wall was shattered and the building set on fire.

ORKNEY.

Knochall, Stromness.—A young woman in a field was killed. The L struck her on the head, her clothes were burned and torn, and her boots wrenched off, but a watch in her pocket was not stopped.

SUNDAY, SEPT. 21st.

LINCOLNSHIRE.

Sleaford.—The church clock and spire were struck during service. A fodder stack in the neighbourhood was set on fire.

Worlaby Top, Brigg.—Wheat stack struck and consumed.

NOTTINGHAMSHIRE.

Dunham-on-Trent.—A large clover rick destroyed.

St. Bartholomew Stile, Nottingham.—Two cows in a field killed.

DERBYSHIRE.

New Mills, Glossop.—The Roman Catholic Church of St. Mary was struck by L; much damage was done to the tower, and several large stones broke through the roof.

LANCASHIRE.

Widnes.—At Kaludah-terrace the L struck a chimney, and passed through a bed-room and a drawing-room; in the bed-room the mantelpiece was shattered, and the grate forced into the room; in the drawing-room the mantelpiece and grate were thrown into the room, the gasalier demolished, and the furniture damaged. The occupant of the house was knocked down and rendered insensible, and his two daughters were stunned. At another house a girl was thrown against a wall and hurt. In Waterloo-road the L passed through the roof of a house dislodging some slates, and a woman in the house was stunned.

YORKSHIRE.

Asenby, Thirsk.—Heifer killed.

Dishforth, Thirsk.—Two sheep killed.

Eldmire Hill, Thirsk.—Two sheep killed.

Flamborough.—A horse standing under a shed at the North Star Temperance Hotel, was struck dead.

Helperthorpe, Great Driffield.—A large oat stack set on fire by L. Two men in a shed near were struck and knocked off their seats, but not seriously injured. This is the second time this summer that this exposed farm has been struck.

Howe Hill Lane, Thirsk.—Implement shed shivered.

Hull.—A chimney stack belonging to two houses in Albany-terrace, Anlaby-road, was struck, and the débris falling through the roof did much damage in both houses; two children narrowly escaped.

Sessay, Thirsk.—Large tree struck.

Topcliffe, Thirsk.—One sheep killed.

Westwood, Beverley.—Union Mill struck ; one sail will have to be replaced.

MONMOUTH.

Dryburgh Street, Monmouth.—L passed down the bed-room chimney of a house, pierced the floor and tore out the grate in the room underneath, besides greatly damaging the furniture.

BRECON.

Penwern Farm, Llanspyddid, Brecon.—A cow killed.

CARNARVON.

Snowdon.—A tourist sheltering in a wooden hut was killed by L, and some reports add that the occupier of the hut was hurt.

SUMMARY.

WE are well aware that in these days it is not easy to induce persons to read through a long list of casualties such as we have at last concluded, but we can assure our readers that there are many cases extremely interesting and instructive.

As our Government (unlike those of France and Germany) does nothing towards the registration of damage by lightning, we have made an effort in that direction this year. But it is utterly unreasonable to expect such work to be done by private effort, and we are certain that our list is very imperfect ; as regards minor accidents, injury to trees, to sheep, and to cattle it is probably less than half the truth. Doubtless further information might have been obtained from the Agricultural Insurance Companies, but the compilation of such a list is not our duty, and it ought to be done officially as in other countries. However, we have done what time allowed, and the results are important, and probably unexpected.

Damage Done.—The table on page 156 gives an analysis of most of the injuries, but not of all, as several did not render themselves readily to classification.

In preparing to compile this table, a difficulty arose from the occasional employment of vague terms. Sometimes a plural is used with no index number, *e.g.*, "sheep were struck ;" in other places it is "some sheep," and "several sheep," and "many sheep." Nothing could be done in the way of compiling a tabular summary without adopting some definition, and therefore a plural by itself, or with "some" prefixed, has been taken as the lowest value, "several" as half as many again as "some," and "many" as about twice "some." But the "some" itself is variable ; "some" horses probably represents fewer than "some" sheep, so that the final result became rather complicated, and had to be worked out into a table, giving the numerical value to be adopted for every vague expression according to the nature of the object. It is not worth while to print the table, but it may be mentioned that the numbers have been kept as low as possible. "Some" was usually

taken as 2 or 3, and only with one object as high as 6 ; "several" generally as 3 or 4, never more than 9 ; and "many" usually as 5 or 6, never as more than a dozen.

The final totals are large ; 35 men killed and 91 injured is a sad beginning to the list, and one to which no money value can be assigned. But as regards the other items, we have tried to form an approximate estimate, a very wild one we admit, but one in which we have tried to keep the amounts low, and in which probably errors will neutralize each other. Leaving the people out of the calculation entirely, the damage recorded comes to nearly £10,000, and had all damage been reported and proper records kept of the values, we have no doubt that it would be nearer £30,000 than £10,000.

Tabular Analysis of Damage by Lightning, July—Sept., 1884.

Date.	MEN.		HORSES.		CATTLE.		SHEEP.		Dogs.	Pigs.	Trees.	STACKS.		Churches.	Houses.	Cottages.	Barns & Sheds.	Chimneys.	Factories.
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.				Destroyed.	Struck.						
July 4	5	8	10	4	42	5	75	...	...	...	27	3	6	1	17	2	2	8	...
" 5	2	7	3	...	6	...	...	...	...	...	6	...	...	1	5	1	...	...	...
" 6	1	1	...	...	14	...	...	...	...	...	...	...	1	1	1	...	...	1	...
" 8	...	3	1	...	3	...	5	...	...	...	3	...	...	...	2	1	...	2	2
" 9	5	14	2	...	20	1	58	...	...	2	6	...	2	1	5	1	1	1	1
" 10	...	2	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
" 12	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" 24	1	2	3	2	12	1	...	...	...	...	...	...	...	...	...	...	...	...	...
" 25	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
" 26	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Aug. 9	5	5	1	1	5	...	4	...	...	1	8	1	1	1	24	...	6	2	2
" 10	...	...	...	...	1	...	8	...	...	...	...	...	...	...	2	...	1	...	...
" 11	1	4	1	...	5	...	31	...	1	...	16	...	...	1	5	1	4	...	1
" 12	9	37	20	1	63	7	33	...	1	...	14	8	6	10	46	3	6	26	4
Sept. 1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" 2	...	...	...	...	3	...	...	...	...	...	1	...	...	...	...	...	...	...	...
" 3	...	1	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" 4	1	...	...	...	...	...	20	...	...	...	...	...	...	...	1	...	...	1	...
" 21	1	7	1	...	4	...	5	...	...	...	1	2	2	3	3	...	1	1	1*
Total	35	91	44	8	181	14	239	...	2	3	82	14	18	20	112	10	21	42	11
Cost of re-in- stating in £ {			1600	80	2110	40	420	...	1	6	164	560	400	600	2240	100	210	210	220

* Windmill.

Geographical Distribution.—The first storm period consisted of exactly a week, with an interval of one day ; injury occurring on July 4th, 5th, 6th, 8th, 9th and 10th. During this period not one accident is reported from the south-western counties or Wales, in fact not one west of a line drawn from the Isle of Wight to Liverpool, and only two south of the Thames. Another noticeable feature was their

persistence day after day in Northamptonshire and Warwickshire. It might be imagined that the storms which prevailed over Northampton and Lancashire on the 4th, passed eastwards and became those of Norfolk and East Yorks on the 5th, but we cannot say.

On the 6th little injury was done, and the sites were widely spread, reaching from Loughborough to Dumfriesshire.

On the 8th the Northampton, Warwick and Leicester group reappears, and it is repeated on the 9th with a north-westerly extension, running up to Preston. There are only three accidents reported for the 10th, and not improbably two of those really belong to the previous day.

A fortnight then elapsed without any damage being reported, and on 24th there were but three cases very widely spread, viz., Sussex, Wilts and Nottingham. The entry for 25th from Rutland is uncorroborated, and very possibly should be for the 24th.

After another interval of a fortnight, we have on August 9th a slight storm in Surrey, and damage in nearly every county from Leicester northwards up to the Border, but only at one isolated place in Scotland. On August 10th there was a heavy storm in the N. of Yorkshire, and damage was reported in the Isle of Man.

August 11th was the first date on which damage occurred in Wales; much injury was also done in Yorkshire, and at two places in Scotland.

August 12th.—This was by far the worst storm of the year. Damage was done in London, Essex, Norfolk, Lincoln, York, Durham, Westmoreland, and over all Scotland, except the extreme north; also in the N.E. of Ireland.

After an interval of 19 days, damage was done on September 1st at Skipton, Yorks; on the 2nd in the county of Gloucester; on the 3rd in Perth, and on the 4th in Argyll, Perth and Orkney.

There was then an interval of 17 days, followed by a rather widespread series, including Lincoln, Nottingham, Lancaster, Yorkshire, and Wales, on September 21st.

Ignition.—Some years since, evidence that lightning produced fire was asked for. Out of the abundant stock furnished by this article, we quote those instances which seem indisputable. Some evidence apparently strong is not really so, *e.g.*, "Lightning struck a cottage from which all the inhabitants were absent, and in ten minutes it was seen to be in flames." In this case the fire was *not* produced by the lightning, but the embers of a nearly dying-out fire were scattered about the room and ignited clothes hung to dry. Much care is therefore necessary before asserting that a case is indisputable, and we guard ourselves by saying that the following cases *seem* indisputable. In consequence of their number we print them in small type:—

July 4th.—*Aston*.—Two men killed in a field, their clothes completely burned.

" " *Northampton*.—*L* appeared to strike a metal bedstead, and then to ignite the skirting board against which it stood.

- July 4th.—*Turvey*.—An ash in a hedge was completely stripped and set fire to.
- „ „ *Whittlesea*.—Ricks set on fire.
- „ „ *Willoughby, Lutterworth*.—A ball of fire was observed to strike a stack of clover, to divide it to the centre and to set it on fire.
- „ „ *Crosshills, Yorks*.—A cartload of hay struck and ignited.
- * „ „ *Carlisle*.—Gas ignited at a house in Blackfriars-street.
- „ 6th.—*Goole*.—L struck one end of a clover stack, passed completely through it and entered the ground; shortly afterwards smoke was seen to arise, and the stack was found to be on fire.
- „ 9th.—*Bramley, Rotherham*.—Railway station struck and roof ignited.
- „ „ *Howden*.—Some haycocks were ignited.
- * „ „ *Meltham Mills*.—Lightning passed through the kitchen, melted some gas pipe in the cellar, and ignited the gas.
- * „ 25th.—*Oakham*.—Lightning entered the church and ignited the gas
- Aug. 9th.—*Chertsey*.—Rick struck and burnt.
- „ „ *Rochdale*.—Petroleum works set on fire.
- „ „ *Beverley*.—Haystack set on fire.
- * „ „ *Stockton*.—Lightning struck a house in Finkle-street, fused a gas pipe, and set the premises on fire.
- „ 10th.—*Moorhouses, Pateley Bridge*.—Barn struck and set on fire.
- „ 11th.—*Glenrines*.—Church struck and [roof] set on fire.
- „ 12th.—*Honing, Norfolk*.—Stack of hay burnt.
- „ „ *Worstead*.—Two stacks of hay ignited.
- „ „ *Scarborough*.—Stack fired by lightning.
- * „ „ *Wigtown*.—Lightning struck the chimney of Rochdale House, split it, entered the kitchen, melted the gas pipe, and lighted the gas.
- „ „ *Broomhills, Edinburgh*.—Haystack set on fire and burned; the lightning was seen to roll along the ground for a considerable distance before striking the stack.
- * „ „ *Edinburgh*.—At the Caledonian station the gas was ignited near the roof.
- „ „ *Newbattle, Edinburgh*.—Haystack set on fire.
- * „ „ *Leith*.—Gas ignited at a tenement in Mitchell-street.
- * „ „ *Newhaven*.—Gas ignited at police station.
- „ „ *West Benhar, Linlithgow*.—Two women severely scorched.
- „ „ *Dalmacouter, Lanark*.—Haystack burned.
- „ „ *Greenhead, Wishaw*.—Hayrick burned.
- „ „ *Merryton, Lanark*.—Haystack set on fire.
- „ „ *Yieldshields, Lanark*.—Hayrick set on fire.
- „ „ *Chalmerhouses, Ayr*.—Hayrick ignited.
- „ „ *Troon, Ayr*.—Thatch roof ignited.
- „ „ *Auchenlodmont, Paisley*.—Stack of hay burned.
- * „ „ *Kilsyth, Stirling*.—Chimney struck, gas pipe fused, and gas ignited.
- * „ „ *Freuchie, Fife*.—Lightning struck a chimney, passed through a room, melted a gas pipe and ignited the gas.
- * „ „ *Union Bank, Auchtermuchty*.—Lightning struck the chimney, threw down the cans, melted a gas pipe under the top floor, and ignited the gas.
- „ „ *Pitkeerie, Fife*.—Haystack struck and burned.
- „ „ *Maderty, Crieff*.—Haystack burned.
- * „ „ *Broughty Ferry*.—Gas pipe melted at Beach, and the gas ignited.
- Sept. 4th. — *Stromness, Orkney*.—A woman's clothes burned.
- „ 21st.—*Brigg, Lincoln*.—Wheatstack consumed.
- „ „ *Helporthorpe, Yorks*.—Oatstack set on fire.

Some persons may regard the printing of this list as "slaying the slain," but that is hardly the case; it has often been asserted that lightning is "disruptive" not "heating." Very possibly after the publication of such crushing evidence as the above, we shall hear that "nobody ever disputed it." At any rate, we present the "purely disruptivists" with 44 nuts to crack.

Lightning and Gas Pipes.—When the Lightning Rod Conference advised* that lightning conductors should be connected with "the nearest gas main, not merely to a lead pipe," there were not a few who regarded the advice as somewhat analogous to putting a lighted torch into a barrel of gunpowder. *There is, however, no instance on record of damage resulting from so doing.* On the other hand, in houses not protected by an efficient conductor, the house gas pipes, being in good connection with miles of mains buried in the streets, become virtually indoor lightning conductors, and are constantly so used by the lightning, as the twelve instances marked with an (*) in the previous table will show; and to them may be added the two following :—

July 4th.—*Kirkcaldy, Fife.*—House struck and gas pipes exploded.
,, 8th.—*Ibstock, Market Bosworth.*—A gas pipe was partly severed.

which do not actually prove ignition. We have thus evidence of damage to gas pipes in fourteen separate cases.

Kind of Trees.—Nearly a century ago, Mr. Hugh Maxwell reported to the American Academy that elm, chesnut, oak and pine were often struck, ash rarely, and beech, birch and maple never struck.

In 1860 Mr. Symons, in a paper read at the Oxford Meeting of the British Association, stated that out of 16 trees struck in the years 1857-59, 6 were elms, the others were oak, ash and poplar.

In the present paper we have the species of 18 trees recorded, *viz.*, ash 6, elm 5, oak 4, plane, poplar and willow 1 each.

Therefore the sequence reckoning from the oftenest struck is—

Maxwell.—Elm, chesnut, oak, pine ash.

Symons.—Elm, oak, ash, poplar.

Met. Mag.—Ash, elm, oak, plane, poplar, willow.

Of course, the above are miserably small numbers to go upon; for instance, our table reports 82 "trees," but only states the species of 18. It is no more trouble to say that an oak was struck than that an ash was struck, and yet the one is far more interesting and instructive than the other.

* "Report of Lightning Rod Conference." London: E. and F. N. Spon, 1882, p. 19.

A TORNADO AT ELY.

To the Editor of the Meteorological Magazine.

SIR,—I forward you the accompanying brief account of a small "tornado" experienced last Sunday near Ely. It may be of service to you if you have received no better.

My informant writes from "The Plains," Littleport, Cambs, under date August 31st :—"We have had a sensation here to-day, and while it is fresh in my recollection I must give you an account of it. About 2 p.m., we were visited by a whirlwind of great power and violence, and as we all saw it I am going to describe it as well as my limited abilities permit.

"Since sunrise the morning had been dark with gusts of wind and rain. About noon the rain became very heavy and the wind more fitful. We were at dinner about 1.30, when it again began to pour, but the wind was not very high. In front of us, you remember, there is a wide meadow bordered by the road, from which it is divided by a hedge with large old elms and ash trees. This hedge also bounds the meadow on the left of the house, and runs at right angles from it to the road. Well, about half-past one, as I said before, the rain began again, and continued till nearly two o'clock, when quite suddenly the wind sprang up again with great violence. I was sitting opposite the window when I saw what looked like a pillar of white smoke down to the S.W. It came rapidly across the fen, and caught the stacks just piled in the long ground the other side of the road. Off went the stacks like bundles of straws whirling in all directions, and on came the pillar gyrating across the road. It caught two old elms, and down they came with a crash, split right across their trunks. Then it waltzed across the field, and caught a young larch tree which it whirled and twisted and bent till its branches touched the ground, but the wood being young did not break. Then it moved across to the other hedge, and snap went three more elms; their tops were whirled off into the air, and blown some distance across a stubble field. We rushed to the back of the house, and saw the pillar whirling along across the fen, carrying all before it.

"The strange thing is, that almost instantaneously after it had passed there was an intense stillness. We hurried out as soon as we could to see the damage, and saw the great trees almost stripped of leaves, and lying in the direction of the wind, the ground almost torn up round them.

"It is nearly impossible to describe the sight while it lasted. The air was full of whirling branches, bundles of wheat, leaves, and poor birds. We heard later on that a cow had been blown into the dyke a little further on. The direction of the whirlwind was due N.E."

That is all my correspondent's account, but further particulars could perhaps still be obtained if necessary.

I am, Sir, your obedient servant,

J. HASTINGS WHITE,

31, Leighton Grove, N. W., 6th Sept., 1884.

SUPPLEMENTARY TABLE OF RAINFALL,
OCTOBER, 1884.

[For the Counties, Latitudes, and Longitudes of most of these Stations,
see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger	1·29	XI.	Carno, Tybrith	3·42
„	Margate, Birchington...	3·92	„	Corwen, Rhug	3·05
„	Littlehampton	1·42	„	Port Madoc	3·91
„	Hailsham	1·35	„	I. of Man, Douglas	2·01
„	I. of W., St. Lawrence.	1·32	XII.	Stoneykirk, Ardwell Ho.	2·69
„	Alton, Ashdell.....	·86	„	Melrose, Abbey Gate...	1·59
III.	Winslow, Addington ...	·89	XIII.	N. Esk Res. [Penicuik]	3·20
„	Oxford, Magdalen Col...	·97	XIV.	Ayr, Cassillis House ...	4·37
„	Northampton	·80	„	Glasgow, Queen's Park.	2·95
„	Cambridge, Beech Ho...	1·23	XV.	Islay, Gruinart School..	4·64
IV.	Southend	1·25	XVI.	St. Andrews, Newton Bk	1·67
„	Harlow, Sheering	1·63	„	Balquhiddier, Stronvar..	9·33
„	Diss	2·71	„	Dunkeld, Inver Braan..	3·17
„	Swaffham	2·69	„	Dalnaspidal H.R.S. ...	6·96
„	Hindringham .....	...	XVII.	Keith H.R.S.	4·35
V.	Salisbury, Alderbury...	·72	„	Forres H.R.S.	2·80
„	Warminster	·87	XVIII.	Strome Ferry H.R.S....	8·88
„	Calne, Compton Bassett	·91	„	Lochbroom	6·97
„	Ashburton, Holne Vic...	1·84	„	Tain, Springfield.....	2·55
„	Holsworthy, Clawton...	2·99	„	Loch Shiel, Glenaladale	15·94
„	Lynmouth, Glenthorne.	2·56	„	Invergarry	8·13
„	Probus, Lamellyn	2·12	XIX.	Lairg H.R.S.	5·47
„	Wincanton, Stowell Rec.	1·02	„	Forsinard H.R.S.	4·21
„	Taunton, Fullands	·46	„	Watten H.R.S.	4·27
VI.	Bristol, Clifton	1·17	XX.	Dunmanway, Coolkelure	4·07
„	Ross	1·05	„	Fermoy, Gas Works ...	1·54
„	Wem, Sansaw Hall.....	1·02	„	Tralee, Castlemorris ...	2·99
„	Cheadle, The Heath Ho.	1·51	„	Tipperary, Henry Street	2·89
„	Worcester, Diglis Lock	1·21	„	Newcastle West	2·49
„	Coventry, Coundon	1·64	„	Milton Malbay.....	4·65
VII.	Melton, Coston	1·21	„	Corofin .....	...
„	Ketton Hall [Stamford]	1·00	XXI.	Carlow, Browne's Hill..	1·78
„	Horncastle, Bucknall ...	1·20	„	Navan, Balrath	1·66
„	Mansfield, St. John's St.	·87	„	Mullingar, Belvedere ...	2·15
VIII.	Macclesfield, The Park.	2·26	„	Athlone, Twyford	2·96
„	Walton-on-the-Hill.....	1·44	XXII.	Galway, Queen's Col....	2·55
„	Lancaster, South Road.	4·11	„	Clifden, Kylemore	6·09
„	Broughton-in-Furness ..	6·07	„	Crossmolina, Enniscoe..	5·01
IX.	Wakefield, Stanley Vic.	·98	„	Carrick-on-Shannon ...	3·57
„	Ripon, Mickley	1·75	XXIII.	Dowra .....	...
„	Scarborough.....	2·08	„	Rockcorry.....	2·94
„	East Layton [Darlington]	1·23	„	Warrenpoint	2·30
„	Middleton, Mickleton..	2·94	„	Newtownards	1·77
X.	Haltwhistle, Unthank..	1·87	„	Belfast, New Barnsley .	2·97
„	Shap, Copy Hill	2·40	„	Cushendun	3·96
XI.	Llanfrechfa Grange	1·10	„	Bushmills	4·31
„	Llandovery	3·36	„	Stewartstown	2·86
„	Lower Solva	1·94	„	Donegal, Revelin Ho....	...
„	Castle Malgwyn	2·28	„	Buncrana	4·65
„	Rhayader, Nantgwillt..	3·93	„	Carndonagh .....	...

OCTOBER, 1884.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.						TEMPERATURE.				No. of Nights below 32°	
		Total Fall.	Difference from average 1870-9	Greatest Fall in 24 hours.		Days on which -01 or more fell.	Max.		Min.				
				Dpth	Date.		Deg.	Date	Deg.	Date.			
I.	London (Camden Square) ...	inches .99	inches. — 1.71	in. .43	9	10	63.9	16	32.2	29	0	7	
II.	Maidstone (Hunton Court)...	1.30	— 1.16	.62	9	10	...	...	...	...	...	...
III.	Strathfield Turgiss .....	.83	— 1.91	.49	9	11	65.2	16	24.7	30	3	6
IV.	Hitchin	1.40	— .78	.83	9	10	60.0	6	30.0	24	3	...	
V.	Banbury .....	.86	— 1.90	.46	9	7	61.0	16	30.0	29	3	...
VI.	Bury St. Edmunds (Culford)	2.33	+ .16	.86	10	12	60.0	16b	29.0	24	4	...	
VII.	Norwich (Cossey)	3.02	+ .69	2.00	10	12	61.0	2, 7	28.0	25	1	8	
VIII.	Weymouth (Langton Herring)	.94	...	.33	9	10	...	...	...	...	...	...
IX.	Barnstaple	3.93	— 1.52	.71	8	20	64.0	1	35.0	13	0	...	
X.	Bodmin	2.40	— 3.87	.58	8	20	62.0	2	36.0	29	0	1	
XI.	Cirencester .....	.85	— 2.39	...	...	...	...	...	...	...	...	...
XII.	Churchstretton (Woolstaston)	1.60	— 3.00	.49	9	11	63.0	16	33.0	11	0	4	
XIII.	Tenbury (Orleton)	1.05	— 2.19	.37	9	11	65.6	16	26.8	13	3	8	
XIV.	Leicester	1.52	...	.40	9	13	64.7	16	31.5	5	1	12
XV.	Boston	1.04	— .99	.23	10	9	62.0	16	33.0	29	0	...	
XVI.	Grimsby (Killingholme)	1.38	— 1.27	.23	10	15	61.0	18	34.0	11g	0	...	
XVII.	Hesley Hall [Tickhill] .....	.94	...	.29	27	12	64.0	18	33.0	5, 9	0	...
XVIII.	Manchester (Ardwick) .....	...	...	...	...	...	...	...	...	...	...	...
XIX.	Wetherby (Ribston Hall) ...	1.26	— 2.10	.32	12	6	...	...	...	...	...	...
XX.	Skipton (Arncliffe)	4.73	— 2.53	.77	29	18	62.0	2	30.0	12	...	...
XXI.	North Shields	1.65	— .86	.65	11	12	61.5	16c	29.8	11	3	4	
XXII.	Borrowdale (Seathwaite)	10.80	— 5.75	2.03	25	21	...	...	...	...	...	...
XXIII.	Cardiff (Ely)	1.34	— 3.89	.40	8	11	...	...	...	...	...	...
XXIV.	Haverfordwest	2.53	— 3.92	.50	11	19	61.0	1	32.0	5	1	2	
XXV.	Plinlimmon (Cwmsymlog) ...	6.07	...	.94	27	18	...	...	...	...	...	...
XXVI.	Llandudno	1.42	— 3.17	.24	27	18	61.8	31	40.2	11	0	...	
XXVII.	Cargen [Dumfries]	1.82	— 3.89	.34	2	15	60.8	17	28.8	11	2	...	
XXVIII.	Hawick (Wilton Hill) .....	.87	...	.28	10	9	...	...	...	...	...	...
XXIX.	Douglas Castle (Newmains) ...	3.18	— 1.76	.60	25	17	...	...	...	...	...	...
XXX.	Lochgilphead (Kilmory)	7.18	— 1.14	1.10	25	22	...	...	30.0	11	4	...
XXXI.	Oban (Craigvarren)	7.03	...	1.10	25	22	60.0	6	36.0	29	0	...	
XXXII.	Mull (Quinish)	9.14	...	1.32	1	26	...	...	...	...	...	...
XXXIII.	Loch Leven Sluices	3.10	— 1.21	1.00	31	9	...	...	...	...	...	...
XXXIV.	Arbroath	1.43	— 1.44	.33	11	9	60.0	3b	30.0	29	1	...	
XXXV.	Braemar	4.24	— .24	1.35	11	17	62.0	6	28.0	28	5	16	
XXXVI.	Aberdeen	2.69	...	.67	10	18	62.0	5d	30.0	28	2	...
XXXVII.	Skye (Sligachan)	17.45	...	4.30	30	26	...	...	...	...	...	...
XXXVIII.	Culloden	1.70	— .59	.56	27	8	62.0	2	31.0	29	1	9	
XXXIX.	Dunrobin	4.16	...	.73	9	18	61.5	21	29.0	29	2	...
XL.	Orkney (Sandwick)	5.40	+ 1.11	.86	25	22	...	...	...	...	...	...
XLI.	Cork (Blackrock)	1.10	— 3.64	.31	23	13	64.0	1e	31.0	24	1	...	
XLII.	Dromore Castle	5.10	...	.90	27	17	62.0	6	31.0	28	1	...
XLIII.	Waterford (Brook Lodge) ...	1.25	...	.46	23	13	64.5	15f	32.0	29	1	10
XLIV.	Killaloe	3.44	...	.69	31	20	63.0	17c	34.0	25	0	...
XLV.	Portarlington	1.95	— 1.52	.66	23	19	61.5	16	31.0	10	1	...	
XLVI.	Dublin (Fitz William Square)	.83	— 2.59	.17	8	14	64.5	2	33.8	11	0	5	
XLVII.	Ballinasloe	2.80	— 1.63	1.02	31	20	60.0	2	32.0	11h	2	...	
XLVIII.	Waringstown	2.55	— 1.06	.40	31	17	64.0	5	33.0	10i	0	3	
XLIX.	Londonderry (Creggan Res.) ..	4.65	...	.71	31	21	...	...	...	...	...	...
L.	Omagh (Edenfel)	4.52	+ .20	1.10	31	21	62.0	6	32.0	10	1	...	

b And 17, 18. c And 18. d And 6, 17. e And 15, 17, 18. f And 16.

g And 29. h And 25. i And 24.

+ Shows that the fall was above the average; — that it was below it.

METEOROLOGICAL NOTES ON OCTOBER.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail S for Snow.

ENGLAND.

STRATHFIELD TURGISS.—Heavy land was too dry for sowing; the clover crop generally was inferior. Autumn tints most beautiful.

BANBURY.—Mean temp. $48^{\circ}0$, slightly below the average. A fine month, but the dryness of the land interfered with wheat sowing; high winds occurred in the last week. The autumnal tints were wonderfully fine, as the leaves fell but little until the last week, and there was an abundance of hedge fruit, including blackberries, which have been scarce of late years. S on 10th; fog on 6 days.

CULFORD.—The month was most enjoyable, and very favourable for wheat sowing. The second week was wet, but very mild for the season.

LANGTON HERRING.—Another dry month, and scarcity of water is causing considerable inconvenience. Mean temp. about the average; the mean pressure was higher than that of any month since January. There was a noticeable absence of storms. Fresh gale on 26th; lunar halo on 28th.

BODMIN.—A remarkably dry and fine October; mean temp. $51^{\circ}8$.

WOOLSTASTON.—The genial temp. of the first few days of the month was succeeded by a week of sharp wintry weather, with occasional storms of S and sleet; after the 14th the temp. rose again, and the remainder of the month was warm and pleasant; mean temp. $48^{\circ}3$.

ORLETON.—The weather till the 20th, with the exception of a few days from the 8th to the 13th, was generally warm and pleasant, with much sunshine; a high and steady bar. The remainder of the month was frequently cold, with rapid fluctuations of temp. and pressure, and frequent rough winds. On the 11th the Clee hills were covered with S, and a severe frost followed on the morning of the 13th. Rainfall very small; mean temp. about the average of the last 23 years.

LEICESTER.—The month was a dry one, and R is very much needed in this county. A remarkable fall of pressure occurred between the 5th and 9th, the difference between the 9 a.m. readings on the two days being 1.204 in.; this was followed by a fall of S, which, however, soon disappeared.

KILLINGHOLME.—A very fine month, but water scarce. Roses still blooming and dahlias, &c., untouched by frost.

ARNcliffe.—Wonderfully dry till the 24th; a wild night on 25th, followed by a period of wet.

SEATHWAITE.—Hills covered with S on 9th; 6.16 in. of R fell in six days, 25th to 30th.

WALES.

HAVERFORDWEST.—The remarkably fine character of the season continued until the 7th, from which date till the 18th the weather was changeable and wet, and from 9th to 12th stormy. Although R was recorded on 19 days, it generally fell in the early morning, and the days were fine and pleasant, and there was a remarkable absence of frost. Autumnal show of berries, and richly coloured tints in the woods and hedges, the finest ever witnessed. Rainfall the smallest in any October since 1850.

LLANDUDNO.—An unusually dry month, though R fell in measurable quantities on no less than 18 days. The mean temp. was slightly below the average, and the range, both monthly and diurnal, considerably below it. It was rather a dull month, the hours of bright sunshine amounting only to 66.

SCOTLAND.

CARGEN.—A dull month, and duration of sunshine 30 hours below the average. Temp. average.

HAWICK.—S on the 10th, and very strong gales on the 14th, 25th, and 30th.

The rest of the month was most genial throughout, and bouquets of single dahlias, sweet peas, mignonette, and many other hardy annuals, could be gathered here at the close.

CRAIGVARREN.—The first part of the month exhibited the usual prevalence of S.E. wind and cloudy sky, but on 10th northerly winds and gales set in with some frost and a general fall of S on the hills. From 25th to the close stormy weather, with constant heavy R and some strong gales prevailed.

QUINISH.—A wet, stormy month; on the whole warm. Wind S.W. to N.W. throughout.

BRAEMAR.—With the exception of snow and sleet on the 10th and 11th, the weather was fine and pleasant.

ABERDEEN.—Good seasonable weather throughout the month. Rainfall somewhat below the average. Strong squalls with sleet on 26th. S gale on the 31st.

CULLODEN.—Very dry weather. R in small quantities fell at long intervals.

IRELAND.

DROMORE.—The last week of the month was very stormy.

WATERFORD.—Rainfall little more than a quarter of the average. Gales on 9th and 30th. Several small flocks of starlings seen.

DUBLIN.—Although a fine and dry month on the whole, a spell of bitterly cold and wintry weather occurred in the second week, and this was in turn followed by a stormy period towards the close, with sudden and extreme variations of temp. The bar. stood remarkably high on the first few days, the exceptional reading of 30·729 in. being recorded on the 5th. The mean temp. was 49°·1, a value almost identical with the average of 20 years. The rainfall was little more than one-fourth of the average for October, which is usually one of the rainiest months of the year. The total is the smallest of any October in the twenty years 1865-84. H on 10th and 26th. Hoar frost on 11th. Mean humidity 84. Mean amount of cloud 5·7.

EDENFEL.—The month commenced with clear warm weather, but a change occurred suddenly and without warning on 8th, and a period of snow, sleet, and rain accompanied by high winds and night frosts followed. The third week was very fine, the fourth stormy and wet. On the 31st, with a perfectly steady bar., 1·10 in. R fell in 18 hours.

ANOTHER HIGH LEVEL STATION.

OUR readers will remember that Mr. Clement Wragge started first a station at Beacon Stoop on the Weaver Hills in Staffordshire, at 1216 ft. above sea, then went north, and started observations on Ben Nevis at 4406 ft. Owing to Mrs. Wragge's health not being good he left Scotland, and went to Adelaide, South Australia. Arrived there, he immediately resumed observations in the plains near Adelaide, and now we learn by the *Adelaide Evening Journal* that he has started a station on Mount Lofty. This mountain is about 2,200 feet high, rising rapidly from the plains at about 10 miles from Adelaide. The station was started on October 1st, and is provided with a Stevenson screen, Richard barograph, a set of thermometers, and a Snowdon rain gauge.

