here, at the close of a brief tour in the Yellowstone National Park, may be of interest:—

Three years ago, Messrs. Wittich Bros., of this city, found some puma cubs in the valley of the Yellowstone River, twenty-five miles from this city. As cubs they showed those spots on the skin to which Mr. Muybridge called our attention at the Royal Society *soirée*, last May, as seen in his photographs of the adult animal, though not in that case visible to the eye. One of these cubs soon died, but the other is now three years old, and is perfectly under the control of Mr. W. F. Wittich, who devoted eighteen months to training her. I saw many proofs of this in his store this evening. The beast not having been fed for twenty-four hours, he trailed pieces of raw meat over her nose and mouth, which the puma never attempted to eat until the word was given, as to a dog. Occasional attempts were made, but a twist of the ear by Mr. Wittich was sufficient to control her. When meat was placed a few yards off, the puma fetched it by word of command, and permitted the meat to be taken from her mouth by Mr. Wittich, who fondled it as he would a cat. A very fine dog, a cross between a pure setter and a pure St. Bernard, five years old, named "Bruce," is on intimate, and even affectionate, terms with the puma, who allowed him to remove meat placed upon her jaws, and to eat it. On one occasion, the puma (who is often allowed to range the house), the dog, and Mr. Wittich, slept together in the same bed, and Mr. Wittich was aroused by the puma attacking some one who roused him in the early morning. When the puma is tied up, the dog always goes to sleep alongside her, and kisses her, the puma responding with a short sharp bark of greeting. The puma follows Mr. Wittich through the streets of this Western city, but has torn to pieces several strange dogs, when unaccompanied by her friend "Bruce." I inclose you a photograph of the dog in the act of removing meat from in front of the puma's jaws; her paws are done justice to, but not the length of her tail. Prior to the exhibition, Mr. Wittich requested the spectators (about ten in number) to remain perfectly still, as the beast (which was loose) noticed, and was angered by, any movement on their part.

Mr. Wittich believes that this is the only puma known to be in captivity, and comparatively tame. In training her he has chiefly used the whip, which she only feels on the nose, ear, and under the tail; he assures me he has made his own teeth meet through her skin in several other parts of her body without her showing any signs of sensation. Her memory is short, and three weeks' intermission of the performance necessitates much extra training and trouble.

I may perhaps add that Mr. W. R. Goodall, an English gentleman who has been living nearly three years ten miles from here on a ranche, assures me that perfect reliance can be placed on Mr. Wittich's statements. What my fellow-travellers and I saw ourselves was sufficiently marvellous, and I am not ashamed to add that we felt somewhat relieved when the animal, which had circulated freely among us, was chained up again! WM. LANT CARPENTER.

Livingston, Montana, U.S.A., August 30.

On some Effects of Lightning.

THE terrific storm which passed over Essex on the night of Monday, the 2nd inst., should give many interesting examples of the effects of lightning. I was at Upminster, 2½ miles from Romford, on the morning following, and had the opportunity of examining a windmill for corn-grinding which had been struck. Perhaps the details may prove of some interest.

The owner, Mr. J. Abraham, and a friend witnessed the flash, which occurred at about 1 a.m., from a window not far from the mill. They describe it as a mass or network of flame, which threw off thousands of sparks like fireworks. After the flash a light appeared on the sail for a few seconds, and they feared the mill would catch fire, but it went out, extinguished, as they suppose, by the heavy rain (I recorded 4·00 inches in seven hours in a field a mile away). I consider it remarkable that the mill was not fired. The splintered wood and cracked boards do not, however, at any attainable point show signs of charring.

The mill is octagonal, and of wood, standing on about 8 feet of brickwork. The joints of the weather boards at the angles are protected by thin sheet lead in strips about 6 × 3 inches, bent over the edge of each board to the next and nailed. At the base of the wooden part is a platform 10 feet wide, and the angle which this makes with the body is also protected with sheet lead. The strips up the angles are connected with this ring round the base, and from the ring again many strips are nailed radially to the edge of the platform. A chain was hanging from top to bottom of the mill, nearly touching the weather boards at the top, and hanging within 2 inches of the boarded ground floor at a distance of about 4 feet from the circumference in the south radius. The upper cap of the mill is revolvable. The sails faced south-east, and were set diagonally.

All the effects of the flash seem to me to indicate that it passed from earth to cloud. One branch of it passed through the iron chain, fusing the links at the points of contact, sufficiently to make them hold together when first disturbed. The flash burst through the weather boarding at the top, breaking the boards away outwards, and then reached one of the iron levers used for opening and closing the shutters of the sails. I was surprised to find no traces of the flash on the boards at the ground. The bottom link of the chain was fused, and there all trace ceased.

A second branch joined the first at the iron lever, coming in the direction described in what follows. Against the north-north-west angle of the platform runs a leaden valley gutter between two outbuildings. The flash seems to have sprung, from some old iron, lying on the ground, to this gutter, and run along it. A small portion went along under the edge of the platform to the west-north-west angle, and then along one of the radial strips. The larger portion entered at once at the north-north-west angle along a radial strip, tearing up the end of it and bending it over on to the platform. On reaching the ring of lead at the base it went round it in both directions, tearing up the lead at every junction, and bending it in the direction of the current. It then ascended by the south-south-east and east-south-east angles only, tearing up each lead strip and curling the end over upwards.

The portion ascending by the south-south-east angle joined that from the inside chain at the place where the boards were burst off. That ascending by the east-south-east angle made a path of its own to the sail lever by perforating a board of the weathering apron which depends from the revolving top of the mill. This perforation, seen from the nearest point I could attain, was evidently from within outwards. The board is cracked from the free edge to the point of perforation, but not badly nor further.

On reaching the ironwork of the sails the whole charge passed along the lever of the north east sail, and on reaching the end of the metal entered the wood. The framework of this was shattered, the shutters smashed and thrown about, bolts broken, and the main shaft splintered. Large pieces were thrown 50 yards and more into an adjoining field.

The charge appears to have left the sail before reaching the extreme end, but as the miller was awaiting the arrival of the Insurance Company's inspector he did not wish to have the sail lowered, and I could not inspect it.

In a few places the lead was partly melted. At some holes where nails were put in, little circles half an inch in diameter were melted cleanly out, and in one place I found the head of a nail partly fused.

I was surprised to find so little damage done to the mill, and think it is a very good illustration of Mr. Tomlinson's remarks in NATURE of August 15 (p. 366), where he suggests that a building to be well protected should have a network of conducting material attached to it. ARTHUR E. BROWN.

31 Vanbrugh Park, Blackheath, September 10.

WITH regard to the two lightning-struck trees near St. Albans, the twisting mentioned by Mr. Pickering is probably not in any way due to the fact that the stroke was dealt by lightning. It is easily accounted for on mechanical principles, even assuming that the toughness of the timber was exactly equal in every part. If the centre of gravity of the dislocated top of the tree lay outside of a certain plane passing through the point of explosion (the position of this plane depending on the tenacity of the stem at that level), such twisting would be inevitable; much as in an earthquake dislocated columns must always be twisted unless the friction of the dislocated surface is equivalent on each side of a certain line running parallel to the direction of motion.

If Mr. Pickering has an opportunity, he might perhaps be able to ascertain whether or no the "core" of each tree is "not exactly in the middle of each stem, but rather to the side