we take the colonnade-wall and assume that it has moved more than the middle wall, you will lengthen one diagonal and shorten the other, and thus get these cracks across all through.

595. *Mr. Blair.*] That wall is sinking more?—The front wall has moved more. Then, in the north wing the cracks are in the reverse direction, extending generally up to this block of chimneys in the middle of the day-room. The direction is reversed, showing that the opposite diagonals of the rooms are being lengthened in the north wing. Of course there is a multitude of cracks all through these rooms, as you know. I did not trace out the exact reason how each of these cracks occurred, because they are bound to be very irregular, owing to great differences in the material, and one thing and another; but these movements in the walls I consider account for every one of them, and the general tilting and straining of the building.

596. *Mr. Gore.*] What do you say accounts for the general tilting and straining of the building?—The settlement I have described, and the consequent movements of the walls. Then, the next thing that I took up was the causes of this sinking.

597. *Mr. Blair.*] Will you describe the foundations?—I have submitted a tracing to show what the foundations are as I found them along the colonnade and round the north wing.

598. Are these foundations constructed to carry more or less than those shown on the drawings?—The foundation under the colonnade has been the general cause of the damage. These foundations are very much weaker than those shown on the contract-drawings. There is about 20 per cent. less concrete in them than is shown in the contract-drawings, and they would carry very much less weight per lineal foot than the original or contract sections. They are all of less breadth, have less depth, and will on that account carry less than half the weight, that the original sections would have done. Also, in both cases these foundations have to act as continuous beams in order to distribute the weight over the clay between the pillars. The original section was twice as strong for this purpose as the present one, and therefore the distribution would have been better; so that, on the whole, probably three to one, or nearly three to one, would be a very fair comparison between the carrying-power of the two foundations.

599. That is, the present foundation is about a third of what it should be?—Yes.

600. How could that have been got over in construction?—It could have been got over by inverts between the pillars.

601. *The Chairman.*] That is, supposing the foundation proved to be very soft and bad?—Yes.

602. An invert might have been resorted to to distribute the weight and strengthen the foundation?—Yes. Also, the middle wall of the building has narrower foundations than are shown in the drawings. They scale some 3ft. wide on the drawings.

603. That is an 18in. wall?—Yes. Along the back wall in three places out of four we found that the wall overhangs the foundation. Instead of the bearing-area being increased in any way it was diminished on the side that we could see.

604. *Mr. Mountfort.*] The scale is 4ft.?—Yes. The footings on the contract-drawings scale 4ft. wide by 15in. deep. That would give you some 5 square feet in a section. Supposing them to be in 2ft. will only give 4 square feet, and we have found them less than 4ft. That would be 25 per cent. less concrete if it is the same on the other side.

605. *The Chairman.*] I understand you found no set-off anywhere on the side you exposed?—No, it goes straight down. There was a little bit of a bulge in one place, but you could not call it a set-off. With regard to the back wall it would only carry, according to Rankin's rules for foundations, about six-tenths of what the original foundation would have carried, and it is a wonder it has not sunk a great deal more. Generally, round the north wing there is a footing shown a foot down, and it was found to exist in no case along the outside. There is a projection here and there in some places, but the concrete goes straight down, and in no case are there footings, or any attempt to distribute the weight over a greater area. At the bay-windows I have a section to show, and you yourselves saw that the brickwork overhangs the foundation. That again is exceedingly bad, because it throws most of the weight on the outer edge of the foundation. Another curious item is that the partition-walls—these narrow 9in. walls in the cellars—have footings in many cases, while the heavier walls that are to carry all the weight have none.

606. I do not recollect if the foundations of the cross-walls are of concrete or brickwork?—Concrete, with sometimes 6in. or 8in. of projection.

607. Have they sunk?—Some have sunk, some have not. The widest is one that has not given way—the continuation of the north wall of the intermediate wing. The principal sinking of the partition-walls has been between cells 3 and 4 and 4 and 5, where there are heavy chimneys to be carried. With regard to the foundations of the back wall—all the foundations I have referred to—I find on trying them by the rules for foundations such as these really are that they are all loaded to a very dangerous extent, and it is a wonder to me that the back wall has not gone down a great deal more than it has—that it has not shown more signs of distress. There are only two old cracks there that I have seen. They are now filled up. That wall is also held up by friction due to the earth pressing against the back. There are some 12ft. of earth against it: that is what it scales.

608. *Mr. Blair.*] Are the foundations deep enough to be out of the influence of the weather?—They are not the depth usually prescribed.

609. Are the foundations in accordance with the depth fixed by authorities as to the depth to which they should be sunk to be out of the influence of the weather?—No.

610. *The Chairman.*] In some climates they would have to be sunk deep to be out of the action of frosts?—In England the depth is some 4ft.

611. Of course that all depends upon the nature of the ground and the climate?

Mr. Blair: The minimum depth, I think, is 4ft.

Witness: The Seacliff clay cracks up a good deal.

612. *Mr. Blair.*] I should like you now to tell the Commissioners what the effect would be if this damage had been caused by a slip from behind. You can describe it in your own words, of course.