

CONCRETE AS A BUILDING MATERIAL.

We afford some extracts from the proceedings of a general meeting of members of the Royal Institute of British Architects in April last.

We consider the consideration of concrete as a building material, a subject deserving of important consideration by both Engineers and Architects in the Dominion; and believe that it might be used to great advantage as a decorative, cheap, and durable facing for wooden houses, irrespective of its great importance for other structures. As usually in such discussions, there was much to be said for and against, but we learn sufficient from the arguments used to know that, if concrete can be produced in slabs at 5c per foot super, in England, we possess the material to make it in this country nearly as cheap, and that the suggestion of Mr. W. H. Lascelles might be turned to great advantage in the manufacturing of ornamental concrete slabs for the decoration and facing of timber houses.

Mr. Alexander Payne, associate, then read a paper "On Concrete as a Building Material." He commenced by noticing the Essay by the conductor of this journal to which the first medal of the Institute was awarded, and which appeared in the "Transactions" many years ago, and then proceeded to give a brief review of the subject as it stands at the present time, and noted the principal patents that have been taken out of late years in connexion with concrete building, which were arranged under the following heads:—Firstly, apparatus for moulding walls; secondly, various kinds of building blocks; and, thirdly, compositions for making concrete. On looking at the results of these inventions, it must, the author feared, be admitted that they had not done much in striking out a new line for the employment of concrete, though they might have improved the material. By far the most common mode of building still practised, and perhaps the best for most purposes, was the old method, described by Alberti, of placing planks on each side of the intended thickness of the wall, and pouring pebbles and mortar between, moving the boards when the compound was set. It was conceded on all hands that concrete buildings were durable, strong, dry, and not expensive; but the general outcry was that they were ugly, and the question arose whether this alleged unsightliness was owing to some inherent deficiency in the material, or to the neglect of the subject by architects. Or was it due to the endeavour to mould the material into shape and forms that had been employed in brick and stone built up in a totally different way? Mr. Payne was inclined to think that the latter causes had the most to do with it. He then proceeded to give some suggestions for the architectural employment of concrete in the future, which were divided under the following three heads, viz.:—(1.) How can the apparatus for moulding and constructing concrete walls, roofs, arches, &c., be simplified and turned to artistic account? (2.) Does not iron offer special advantages for use in connexion with concrete? (3.) What is the proper way to ornament concrete walls, arches, and roofs, in accordance with the peculiar properties and nature of the material? Under the first head, it was suggested that the apparatus for moulding concrete buildings might frequently be made a permanent part of the structure by forming a light skeleton framework of wood or iron, of ornamental design, for supporting a temporary moulding-board, and then filling up with concrete. Under the second head, it was stated that no two materials were so admirably suited to go together as iron and concrete. With the one a light skeleton framework could be made of almost any dimensions, and of great strength and lightness; and in the other we had a plastic material that could be moulded into any shape, and could be made to enclose the skeleton and give it substance and solidity; and it was well known that if iron was completely embedded and kept from the air, it was entirely protected from rust and oxidation. But, more than this, iron was just the material to give to walls the tensile and building strength they lacked, and to counteract the failures that most commonly took place in brick and stone construction. As to the ornamental appearance of houses built in iron and concrete, the effect would not be unlike that of the half-timbered houses of the middle ages, but the ironwork would be capable of greater freedom of treatment than the ancient woodwork. Under the third head, viz., "What is the proper way to ornament concrete walls, arches, roofs, &c., with due regard to the peculiar

nature of the material?" the author submitted that instead of imitating the projections of stone and brickwork, the aim in concrete work should be to obtain as large wall-spaces as possible, and as few projections, and to ornament instead by indentations. There had been no building material employed which offered such facilities for rich ornamentation by this means, at a comparatively trifling cost, as concrete. It was pointed out that most of the magnificent decorations of the Alhambra and the Mahomedan buildings of India were produced by incised ornament of this description; and there could not be a better or more suitable method for ornamenting a concrete façade. Examples were given of how this might be effected by movable dies fixed on the moulding-boards used in concrete construction. This method was in reality bringing the principle of the printing-press to bear upon the ornamentation of a building, and had its practical as well as its artistic side, by substituting letters for ornamental designs. Where permanent advertisements or records were required, or where it was desired to preserve an account of the origin or purpose of any building, why should not such account be printed in the solid wall in concrete, and be made to form part of the structure and design of the building? Could we not, in fact, in this respect, often advantageously follow the example of Assyria and Egypt, and, without going back to cuneiform characters or hieroglyphics, still usefully record on our buildings the purposes for which they were erected? It was also shown how, by the same method, a veneer of tiles, marble, or plaques of a particular shape, might be bedded on the surface of the wall, and how the stone and flint panelled work of Essex and Suffolk might, in the same way, be readily done in concrete. Plaster decorations and *stucco* were then referred to as being eminently suitable for the decoration of concrete; and the authorities of the South Kensington Museum were said to have rendered good service to the English public by giving practical illustrations of the beauty that might be obtained by this mode of decoration at the back of the Science and Art Schools at Kensington, and at the National Training School for Music, adjoining the Albert Hall. The author concluded by giving examples of the methods suggested for the employment of concrete, and by showing how they might be advantageously applied to domes, vaults, and other structures.

DISCUSSION.

Mr. Charles Barry said he had not used concrete at all, except for foundations, and he confessed that he should have great hesitation either in using it or in permitting its use in the methods treated of in the paper,—not on account of any doubt as to its strength, for he should have every confidence in its being used scientifically and substantially, especially if the construction of the building were to be superintended by one so conversant with the subject as the reader of the paper appeared to be. One of the most valuable of the many suggestions contained in the paper was that of using iron as a framework. Indeed the Improved Industrial Dwellings Company, of which Sir Sydney Waterlow was chairman, had for several years past used iron in combination with cement concrete with very good effect, especially for such purposes as steps, landings, and lintels, which were rendered enormously strong by embedding small pieces of iron in concrete. But although concrete building, when thoroughly well done, was possessed of great strength and durability, yet if employed by inexperienced or unscrupulous builders, it was a material which offered greater opportunities for "scamping" than stone or brick, either by the use of bad materials, or by insufficiency of labour in mixing, &c. It should be remembered that a badly-constructed concrete house was likely to fall much more suddenly than a badly-built brick one. A brick building generally gave sufficient warning of its intention to fall, but bad concrete buildings collapsed without having previously exhibited the slightest indication of instability. The suggestions made by Mr. Payne as to the ornamentation of concrete buildings by projections and indentations were very ingenious, but it was extremely questionable whether concrete buildings so ornamented would be cheaper than brick buildings with the same amount of ornamentation. It was to be regretted that Mr. Payne had not included in his paper some indication of the cost of producing anything like architectural effect with concrete as compared with brick or stone, but possibly sufficient experience had not been acquired in that direction to enable an accurate comparison to be drawn.

Mr. W. H. Lascelles, on the invitation of the president, then proceeded to describe the construction of his patent concrete slab cottages, &c. These erections, of one of which a considerable portion had been put up in the Institute meeting-room, consist of an inner framing of timber uprights, or studs, 3 ft.