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TIMBER CONSTRUCTION A NEW DEVELOPMENT.
Novel Tower at Kirup.

To supervise the construction of a fire lookout tower at Kirup which he designed, Mr. Ian Langlands, timber mechanics officer of the division of forest products of the Council for Scientific and Industrial Research, arrived in Western Australia about October 14. The tower (which is of unique construction), having been completed, Mr. Langlands left Perth for Melbourne by the Great Western express on Saturday night.

In spite of its many advantages, said Mr. Langlands on Saturday, timber had for some years past been losing favour as a structural material. However, modern methods of design had given timber a new lease of life and in Europe and America timber was now competing with and even displacing steel as a structural material for such uses as tall towers, roof trusses, large halls, etc. This was particularly remarkable in Germany, where most of the timber used in large structures was imported and was comparatively expensive, while steel was very cheap. Perhaps the most spectacular use to which timber had been put was in the high radio towers' which were scattered over Germany. There were a number of these over 300ft. high, and one recently constructed had reached the amazing height of 625ft. In America towers up to 300ft. high had been constructed, and just recently a large arch timber bridge was completed on one of the main arterial highways.

The principal factor responsible for this revival in the use of timber was the development in Germany during and after the war of new methods of constructing joints by the use of what was commonly called connectors, To understand the revolutionary change that was accomplished it was necessary to appreciate the fact that the strength of the structure was limited by the strength of the joints. With ordinary methods of construction in which the timbers were bolted together it was possible to develop only a small percentage of the strength of the various members, with the result that the timber used had to be unduly big and heavy. By using modern connectors, however, the joints could be designed to have practically the same strength as the members, with the result that for a joint of given strength the size, of the timber used could be greatly reduced. A great variety of these connectors had been introduced, but two were of outstanding importance. One, the alligator type, consisted of a toothed ring of steel ring which was pressed into the wood between the various members at the joint. The other, or split ring type, consisted of a steel ring which was fitted into pre-cut grooves in the various members. The whole joint was held together by a bolt which took none of the load but was. merely present to hold the members together. Thus

the connectors could be likened to dowels of large diameter which, while capable of taking great loads, did not weaken the timber to any extent.

New Methods Applied.

Believing that the modern connectors would be of considerable assistance to the timber industry in Australia, continued Mr. Langlands, the division of forest products of the Council for Scientific and Industrial Research obtained samples of the various types of connectors used overseas, and was starting in extensive Investigation into their behaviour when used with Australian hard woods. When visiting the laboratories of the division of forest products recently the Conservator of Forests (Mr. S. L. Kessell) was greatly impressed with the possibilities for modern connectors, and arranged for an officer of the division to design a fire look-out tower of approximately 100ft. in height for the West Australian Forests Department, using split ring connectors. The construction sf this tower, which was 103ft. high to the platform, and 112ft. high overall, had just been completed. It was located on a hill near Kirup, and had an extensive, view of the surrounding forests, the use of modern connectors enabled the size of the various members' to be Sept to a. minimum, with the result that the tower had a 'spidery'' appearance, more characteristic of steel than of wooden structures. Thus, the four corner posts varied from 8ft. by 8ft. in cross section at the base to 4ft. by 4ft. at the top, and the bracing 'system -was practically all 4in. by 2in timber. The tower was 20ft. square at the base, had an 8ft. 8in. square platform at the top, which was, boarded in for a height of 4ft. - 6in. and had a galvanised iron roof. Access to the platform was by a staircase up the centre of the tower.

The tower was designed to withstand hurricanes up to 100 miles per hour, and was held down by four concrete footings 6ft. 9in. deep and 5ft'. square. In constructing the tower, the four sides were first completely assembled on the, ground and all bolt holes were drilled. Each piece was then carefully marked and the sides were taken to pieces and the grooves drilled for the connectors. The tower was then erected piece by piece. After the first 15ft. no scaffolding was used. The tower was constructed entirely with green jarrah with the exception of the stairs, which were of dry jarrah. The tower was a striking example of what could be done with modern design methods. “The performance of this tower will be watched, with great interest all over Australia”, added Mr. Langlands. “If it proves successful, as is confidently expected, it promises to usher in a new phase of timber utilisation in this country”.