

## SCIENCE:

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Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

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## THE WAITOMO CAVES, NEW ZEALAND.

IN a report to the Surveyor-General of New Zealand, Mr. Thomas Humphries gives an interesting description of a visit which he and a small party made in June last to the Waitomo caves, King Country, in the North Island of New Zealand. The Waitomo River, a tributary of the Waipa, which passes through these caves, lies about eighty-five miles south of Auckland in a direct line, though it is about twenty miles further by rail and road. The caves are about ten miles from Otorohanga railway station. The country around is undulating. A quarter of a mile before the caves are reached, the Waitomo, of about twenty feet in width, is seen emerging from the side of a hill, under which it has meandered through limestone caverns of various sizes for about twenty chains. A light canoe can be taken along the river through the caves to within a few chains of its egress, where further progress is barred by the roof coming down to the water.

At the entrance to the cavern the stream is eight feet deep. The natives have never had the courage to enter. The entrance to the cave, thirty feet wide and twenty feet high, is in the face of a cliff. It is beautifully arched, with numerous moss and lichen-covered stalactites. In a canoe the visitor is taken in, ninety feet from the entrance, and landed on a silt-covered beach. By the aid of candles, for all is now dark, he finds himself among ponderous stalactites, three to six feet thick, reaching from the roof, twenty feet high, to within a foot of the ground. Everywhere, all over the extensive and intricate caverns, are seen stalactites and stalagmites of immense size, in vast numbers, with marvellous beauty of form

and color. At one place the dark vault was studded with thousands of glow-worms, giving the vault the appearance of a starlit sky.

Passing down the left bank of the stream for one hundred and forty feet, over a large deposit left by floods, the party crossed it by means of a foot-bridge. From the entrance to the bridge the cavern averages fifty feet broad, and from twenty to thirty feet high. After crossing the bridge, a sharp turn to the right is made up a steep incline for a distance of seventy feet, to the foot of a ten-foot ladder, which leads to a narrow passage four feet wide and fifteen feet high, the entrance to the "Grand Cavern." Here is the bottom of the "well," a narrow shaft running up to another series of caves over the lower ones, where it is again met with in the gallery above. The well is four feet across, perfectly true, as if made by human hands, and its sides beautifully marked with horizontal streaks, formed of laminated lime-stone. In the Grand Cavern is an immense mound of material evidently fallen from the roof.

Beyond the Grand Cavern the roof rises and forms two domes, one fifty feet high. High up, forty feet, is the entrance to another cavern. Beyond the dome there is a sudden fall, the roof lowering so much that the visitor has to stoop. The length of the Grand Cavern, at the end of which the stream is again met with, is two hundred and fifty feet. It varies in width from fifteen to forty feet, and from twenty to fifty feet in height. Up to this point the color is a dull brown and a light yellow; but in the upper galleries, thirty feet above, there are alabaster and Parian-marble-like scenes of unsurpassed loveliness.

Twenty feet above the Grand Gallery is the "Organ Gallery," so-called from the appearance of the great stalagmitic mass one hundred and fifty feet from its entrance, rising tier upon tier, like the front of an organ with marble pipes. From the Grand Gallery the Main Gallery above is reached by a twenty-five-foot ladder, and sixty feet along it the "well" is reached. Here it is twelve feet in diameter, with smooth sides of hard limestone, and the sound of moving water below. This is forty-five feet above where it was first seen. Fifty feet along from the upper well is a "fairly grotto," and through an archway thirty feet in length the "Banquet Chamber" is reached, where the surveyor and his friends found a hot dinner had been provided by the natives who own the caves. At the end of this chamber is the White Terrace, a stalagmitic mass rising in a series of terraces. From this the upper entrance to the caves is reached, high in a wooded cliff, sixty feet above and directly over the lower entrance. Mr. Humphries describes in glowing terms other galleries and caves, but this may suffice to show, that, notwithstanding the destruction of the Rotomahana Terraces, New Zealand has still plenty of wonders.

## THE WENSTROM DYNAMO.

SOME months ago a description and illustrations of the Wenstrom dynamo were given in these columns. A dynamo of this make was recently sent to the electrical testing bureau of the Johns Hopkins University, where it was submitted to a series of tests, the results of which are given below, under the signatures of Drs. G. A. Liebig, Louis Duncan, and W. F. Hasson. It may be mentioned here that the dynamo tested was designed to give an output of 400 ampères, at 110 volts, running at a speed of 500 revolutions per minute; while the speed under which the tests were made was only 330 revolutions per minute.

"The dynamo electric machine sent to us for examination, a report of which is contained in the following pages, was described by the manufacturers as an 800-light dynamo, and was stated to absorb energy, when doing full duty, at the rate of about sixty-horse-power.

"Having our source of motive power and testing apparatus already in place for the purpose of conducting some experiments on other dynamos, the following tests were made (through the kindness of Mr. F. Hambleton, who consented to allow the bureau the use of a part of the works under his charge), at the plant of the Consolidated Gas Company of this city [Baltimore].

"Here we had set up an Armington & Sims engine of about seventy-horse power capacity; belted to which was a Tatham